

A comprehensive guide to “Efficient Open Innovation”

Benefits and challenges - A European perspective



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Preface

An increasingly global business environment combined with rapid technological progress has changed the framework in which companies operate. Confronted with this growing complexity in combination with growing customer demands, fierce competition and market pressure, companies have started to recognise that the “invent-it-ourselves” model is no longer sufficient to stay competitive. The model is both too slow and costly, and does not provide the right access to technologies and talent. The focus for many companies has changed from continuous development to rapidly develop and test new business models in the market. Open Innovation (OI) is key to tackle these challenges. When considering an innovation process, companies need to have the right answers to major challenges and questions, such as:

- What kind of OI is best for my organisation?
- Are we part of the right ecosystem?
- How do we access appropriate technological facilities?
- What about our human capital? Do we know how to respond to this crucial factor for OI success?
- Are there any successful business models? Which one fits our organisation?

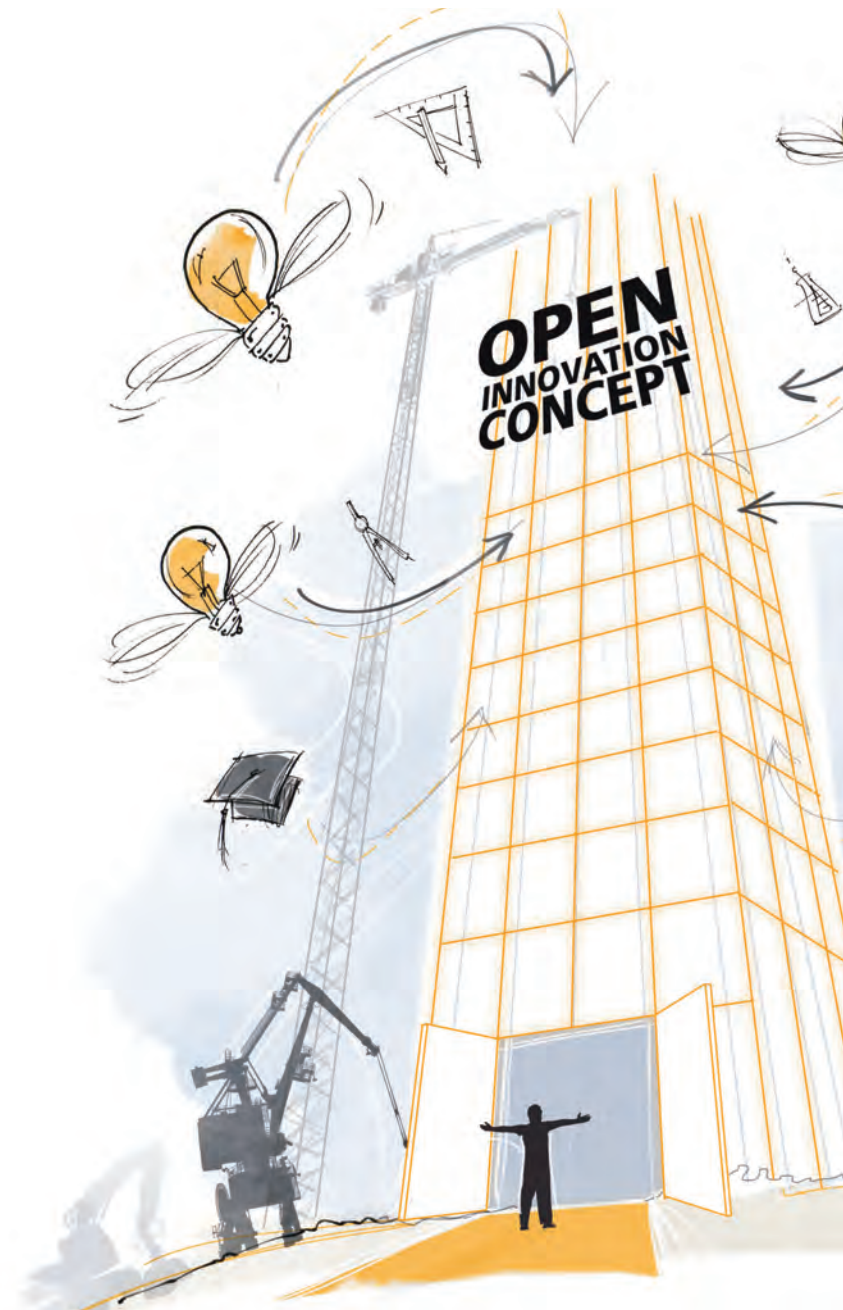
You will find the answers to these questions in this report, which features the results of ACE's 2012 OI survey, and highlights the success factors for OI. Like previous ACE reports, this study is based on four elements:

1. ACE 2012 OI Survey carried out amongst our clients and business contacts during the summer of 2012.
2. A selection of interviews that ACE held with experts and role model companies.
3. ACE OI project experience as business consultants across Europe (ACE case studies).
4. Related literature and other case studies (independent ACE research 2012).

We hope this report inspires you to (further) open up your own innovation process, so you too can benefit from its many advantages. We would like to thank all of our clients and business contacts for their support, and sharing their views and opinions on the different aspects of OI. We also appreciate the opportunity to have interviewed Wim Vanhaverbeke, an international expert on OI processes.

About ACE

ACE – Allied Consultants Europe – is a strategic partnership of 11 leading European management consulting firms. We are experts in the fields of strategy, organisation change and business performance, and have been working together – as one – since 1992. In 21 offices all over Europe, more than 700 consultants offer local know-how and international expertise to our clients, in both the public and private sectors. ACE regularly publishes reports and conducts European surveys on a wide range of business issues. The ACE Open Innovation project team: Magdalena Delucis, Axel Ege, Olivier Exertier, Alessandro Goldaniga, Johan Lawaetz, Carlo Marinoni, Arjen van Nuland, Giovanni Raimondi, Claus Sehested, Agaath Slujiter, Martin Würthner and Friederike von Zenker.





EXECUTIVE SUMMARY	4
OPEN INNOVATION: AN INTRODUCTION	7
What is Open Innovation?	7
Why Open Innovation?	8
ACE approach to Efficient Open Innovation	11
THE FOUR DIMENSIONS OF OPEN INNOVATION	13
Networks	13
Technology	22
Human capital	29
Open business model	36
CONCLUSION & RECOMMENDATIONS	46
GLOSSARY	47
REFERENCES AND PHOTO CREDIT	49
PARTNERS	50

Executive summary

What is Open Innovation and what makes it successful?

The era of “invent-it-ourselves” is gone. An increasingly global business environment combined with rapid technological progress has changed the framework in which companies operate. Confronted with this growing complexity in combination with growing customer demands, fierce competition and market pressure, companies have started to recognise that the “invent-it-ourselves” model is no longer sufficient to stay competitive. The model is both too slow and costly, and does not provide the right access to technologies and talent. The focus for many companies has changed from continuous development to rapidly develop and test new business models in the market. Open innovation is key to tackle these challenges.

What is Open Innovation?

The concept of Open Innovation (OI) has radically changed the way we think of innovation, as explained Berkeley Professor Henry Chesbrough in 2003. Even though OI takes various forms, its key message remains the same:

“Opening up innovation activities by either harnessing external ideas internally and/or leveraging internal ideas externally.”

BENEFITS OF OI

Across different types of organisations – small and big, public and private – many have created their own experiences when applying OI approaches in their innovation processes. We carried out a survey on the benefits of OI. Private companies emphasise that OI:

- Improves research and development (R&D) performance;
- Improves efficiency and realise cost savings;
- Increases the success rate of their products/services.

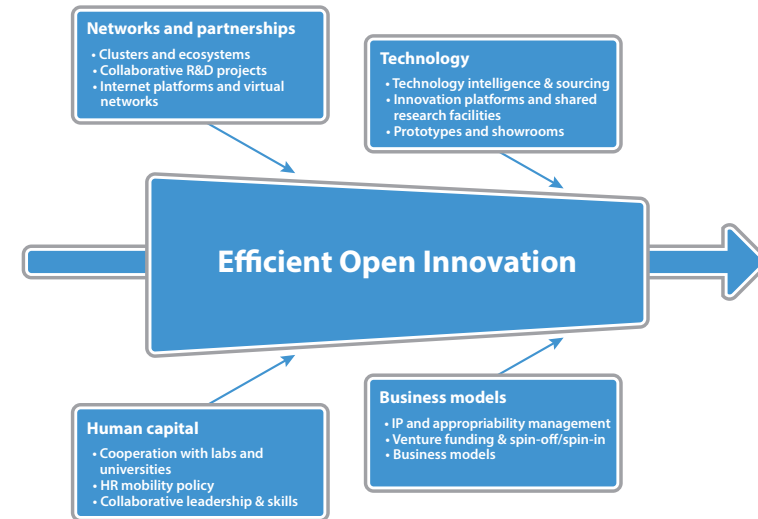
Public sector organisations can use OI to tap into the unlimited creativity of their citizens to find solutions to bigger societal challenges. Moreover, they can act as experimentation territories by applying technologies developed by the private sector to real life conditions. In the public sector OI helps to:

- Reinforce cooperation with citizens to develop social innovation projects;
- Provide better transfer of knowledge, people and technologies.

How to apply Open Innovation?

In this report, we describe four important dimensions for the successful implementation of OI (see table opposite). For each dimension, we also provide recommendations on how to tackle the various challenges. In order to do that, we combined our extensive knowledge

as business consultants and insights from all over Europe, with the lessons learned from interviews, case studies and the results of our 2012 OI survey.



Source: ACE Analysis 2012

THE FOUR DIMENSIONS OF OPEN INNOVATION

NETWORKS

Effective OI is not only the result of knowing each other well, but more importantly, of trusting each other. It is therefore vital important to strengthen the relationships within the cluster and to focus on efforts to close the gap of trust, such as facilitate meetings and create opportunities for dialogue. When people are better acquainted with each other, relevant content can be exchanged more easily.

This section investigates the role of clusters, ecosystems, networks and collaborative R&D projects in the context of OI. These “physical networks” are complemented by an ever-growing number of Internet platforms and virtual networks.

TECHNOLOGY

The integration of the external contributions into the R&D department has to be managed carefully in order to prevent the accidental consequences of the NIH (Not Invented Here) syndrome.

This part is dedicated to practices in the field of research and technology developments, such as technology intelligence and sourcing, shared R&D infrastructures and facilities, as well as “open testing”

HUMAN CAPITAL

“Yet human capital is a hugely important factor. A lot of projects fail because they lack the right people with the right skills.”
Wim Vanhaverbeke, 2012

Human capital focuses on the “soft factor” human resources and describes its role in the collaboration between companies, labs and universities. It also deals with related topics, such as the development of effective HR mobility strategies and collaborative leadership.

BUSINESS MODEL

Open business model implies a new approach to Intellectual Property (IP) management; companies have to by pass defensive reactions to consider IP as a strategic asset, allowing interaction with their environment. Business angels and venture capitalists can play an important role in the OI process providing not only money, but also competencies and networks to entrepreneurs.

This section highlights IP and appropriability management issues, along with venture funding and open business models.

THE NEXT STEP

Real case studies and company examples in each chapter demonstrate and prove the different aspects of OI. We believe the key success factor for most of the case studies is an open attitude throughout the company, the change of mindset and the concrete set up. OI can be applied in all stages of innovation, idea generation, research, development and commercialisation – but where you begin and how fast you go depends on your given situation and ambition. Given the nature of OI processes, there are a few challenges that organisations need to tackle. Our survey shows that the most relevant challenges in 2012 are as follows:

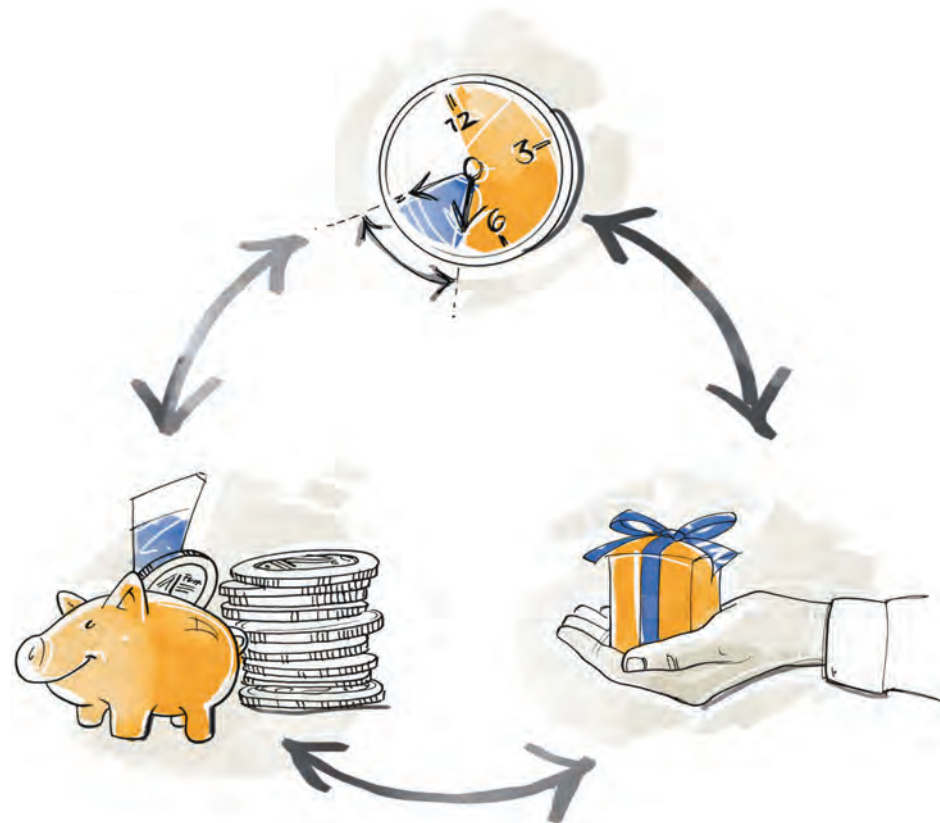
1. How to choose the right business partner?
2. How to shift mindset and culture?
3. How to protect IP?

We think that a thorough comprehension of the impact of the four dimensions on your organisation can help you to take the next step.

Let yourself be inspired by the various case studies and the results that an OI process can bring!

At the end of this report, you find an overview of all the case studies described and the relevant dimension and stage of innovation they refer to, together with a checklist that aims to help you assess your own capacity and maturity in relation to OI.

The ACE OI team invites you to discuss the results of your individual assessment with us, with the objective of defining future actions that will further strengthen your capacity to open up your innovation processes.





Open Innovation: an introduction

What is Open Innovation?

“Most of the smartest people work for someone else,” says Joy’s law – named after Sun Microsystems’ founder Bill Joy. Tapping into this intelligence to improve product/service offerings or their processes is the basic principle of Open Innovation (OI).

OI has many facets, but whether we call it user-driven innovation, distributed innovation, co-creation, open source or cloud innovation, the key idea is the same:

OI means harnessing external ideas and contributions internally (Outside-In approach), and/or leveraging internal ideas externally by making them available to external parties and valuable to the organisation’s own revenue stream (Inside-Out approach).

In 1986, MIT Professor Eric von Hippel introduced the term “lead user innovation,” often mentioned in relation to OI. The idea behind it is that users and consumers are actually the

real innovators of new products, and not the manufacturers. Professor von Hippel was one of the first to notice this trend: “Products are developed to meet a wide range of consumer needs. If some users experience unmet needs, they make the adjustments themselves to satisfy their own needs. Often these ideas and suggestions are then fed back to the manufacturing companies hoping that the next product generation will include them.” User innovation can be found across a wide range of products from home cleaning products to medical devices, including services.

The term “Open Innovation” was eventually coined by Berkeley Professor Henry Chesbrough in 2003, and since then it has influenced the mindset of companies around the globe. Having initially evolved from the high-tech sector, especially software firms, the OI paradigm has now spread to most industries around the world, and has become a hot topic in innovation communities.

Our increasingly global business environment combined with rapid technological change has changed the way businesses compete. Companies now face more demanding users, fiercer competition on knowledge, quality and customer relations, stronger pressure on time-to-market, shorter product life cycles and increased focus on cost effectiveness. This has made it more difficult for firms to enjoy knowledge monopolies – an example of this is the fact that small firms now account for 30% of all patents in the US compared to just 5%, some 40 years ago. These conditions have made companies embrace new and potentially more effective ways of innovating.

Over the past 10 years the idea of OI has attracted more attention, and companies have seen the value of opening up. They have realised the potential benefits of collaborating with external parties in new product development and R&D activities.

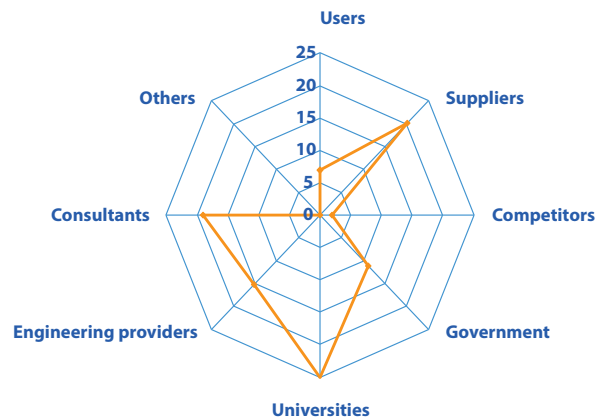
A survey carried out by ACE in 2012 on how OI is applied in European organisations, reveals that more than two thirds of all respondents are already applying OI principles within their business. It also demonstrated that those applying OI within their organisation, mainly collaborate on:

- R&D projects (in the context of networks).
- Cooperation between companies, labs and universities (human capital context).
- Prototypes, demonstrations and showrooms (technology context).
- Open business models, such as spin off/spin in, licensing, patent transactions, etc.

Why Open Innovation?

When it comes to choosing the right partner to start your OI process, universities, suppliers and consultants are the preferred collaboration partners. This is, at first sight, understandable due to the sensitiveness of opening up an innovation process: suppliers along an organisation's value chain seem easier to manage than any potential cooperation with competitors.

Figure 2: The main partners in Open Innovation in %



Source: ACE Open Innovation Survey 2012; n=42 participants

There are many reasons for the shift from closed to OI over the past decade. It's not just the battle for innovation leadership that pushes organisations to open up both ways – Outside-In and Inside-Out. The old model, where internal R&D controlled all innovative breakthroughs, as well as being the main strategic asset, is no longer sustainable. Most European small and medium-sized enterprises (SMEs) focus their budgets on innovation (see ACE survey 2009, page 16) and therefore have to win the war for talent to achieve innovative breakthroughs; but to attract the best is getting difficult as there are more skilled people around the globe and their mobility is rising. It is sometimes impossible to attract and retain the best and highly skilled. But instead of fearing this fact, smart companies are embracing this new reality and are now collaborating with these talent pools. These may even include customers thanks to the hyper-connectivity and digital world we are living in. The principle of the "embedded customer" is deployed more and more.

Intensive and continuous research within the industry, especially at universities and independent research labs, also increases the pressure to cooperate with the outside world as chances of coming up with new breakthroughs are higher. Furthermore, the increasing availability of **venture capital** helps start-up companies to get into the market and commercialise their innovative ideas.

We demonstrate how OI strategies can be successfully applied no matter how large or small an organisation is, and regardless of whether it's public or private – see the following chapters on the benefits for enterprises and public organisations applying OI principles. The capacity of organisations to position themselves at the centre of the ecosystems in which they operate and find synergies with the stakeholders around them is key to success.

The benefits outlined opposite are relevant for both OI approaches: the **Outside-In** and the **Inside-Out**.

OI Benefits for enterprises

OI has been largely applied by large multinationals, such as Procter & Gamble, Roche, General Electric, Philips and Bosch. However, it's not only the bigger companies that can benefit from external actors. SMEs can also apply this concept to get access to a larger customer group, leverage specific technologies, work with their suppliers, or to build partnerships with bigger companies and research institutes.

According to ACE's 2012 OI survey, the main benefits of OI, include a higher success rate in new product and service launches, better R&D outcomes and clear cost savings, hence improved overall efficiency as the figures below indicate.

Figure 3: Major benefits of applying OI

Increases success rate of products and services	93%
Strengthens R&D performance	86%
Improves efficiency and cost savings	82%

Source: ACE Open Innovation Survey 2012, n= 42 participants

OI INCREASES SUCCESS RATE OF PRODUCTS AND SERVICES

Better information on customer and market needs: OI is a very effective way to implement user-driven innovation, by involving the customers in product/service development ("need information"). Firms therefore get access to knowledge and gain a deep understanding of user requirements, trends and habits, so they can guarantee that products match market needs and, ideally, avoid costly product failures. They no longer have to invest in traditional market research, which often presents a complex picture of the past and therefore solutions are not always up-to-date with customer trends or needs. Also better knowledge of the market and customer needs gained in OI processes reduces the risk of failure.

Improved company reputation and customer commitment: OI involves the customer/user directly in the product elaboration and co-design process, in some cases in return for financial remuneration or product-linked advantages. This approach enables companies to create customer loyalty and brand ambassadors, ensuring their commitment to purchase early on. Furthermore, lead users and early adopters can be identified and included in the commercialisation process. OI can also boost a product's/company's reputation for being customer-focused.

New markets: According to Professor Chesbrough, OI processes enable companies to reach new markets (for their own organisation and/or its cooperation partners too) in addition to the target market enabled by internal R&D departments. For example, companies are increasingly turning to municipalities as a new target group to apply their technologies in real city contexts, thus, complementing their business-to-business models. In this way a new market can be created for the delivery of urban innovations, along with the opportunities to test technologies by working already at an early stage with potential future clients. This approach can help companies ensure the successful uptake of their products and services.

OI STRENGTHENS R&D PERFORMANCE

Access to new (technological) solutions/possibilities: The opening up of the innovation process enables companies to gain valuable ideas for new products and services, or to solve technical problems that are vexing or far too complex to be solved internally. The more complex and radical an innovation is, the larger the need to access solution information from different domains. Finally, working with outsiders also brings solutions to problems that companies may not have recognised as important ("solution information").

A tool for better internal alignment and R&D focus: OI helps companies to focus on what they are actually looking for and where they should operate/allocate limited resources. Companies need first to clarify, internally, exactly what their R&D needs and challenges are, before asking for solutions from external partners. Without this "reflection process" they risk receiving lots of ideas, but perhaps none that are really suited to their challenge/need. This way, companies can direct their attention to, for example, specific technological problems, strategic challenges or the top consumer needs.

OI IMPROVES EFFICIENCY AND COST SAVINGS

A more efficient innovation process and faster time to market: External collaboration helps improve the usability of ideas, enabling faster development and market launch of new products and services. The reduced time to market offers a competitive advantage and results in higher revenues, market share and profits. For example, in-licencing strategies enable companies to rely on a partner (through a licence contract) to combine the resources and costs associated with developing and bringing a product to market.

Opportunity to share resources: Technological platforms enable companies to share investment for high-level R&D infrastructures and equipment, which they may not be able to afford individually. In addition to the cost saving and risk reduction, sharing these technological platforms have significant impact in terms of network and partnership building.

OI Benefits for public sector organisations

OI can provide a powerful way for public authorities to tap into the unlimited creativity of its citizens to tackle some of the bigger challenges faced by society today.

REINFORCES COOPERATION WITH CITIZENS

Promotes social innovation: For public administrations and non-profit organisations, external collaboration with citizens is a way to promote social innovation. It offers new ways of social dialogue and participation, enhancing the quality of the common good by applying methods such as idea and innovation contests (Citizen ideation and innovation). Competitive “calls for ideas” for solutions to social challenges aimed at the wider public through crowdsourcing platforms is an example of how public authorities can do this.

More efficient administration: By harnessing public knowledge, existing public administrative processes can be enhanced (Collaborative administration). In particular, citizens can support public task fulfilling, and help improve administrative processes with regard to quality and speed.

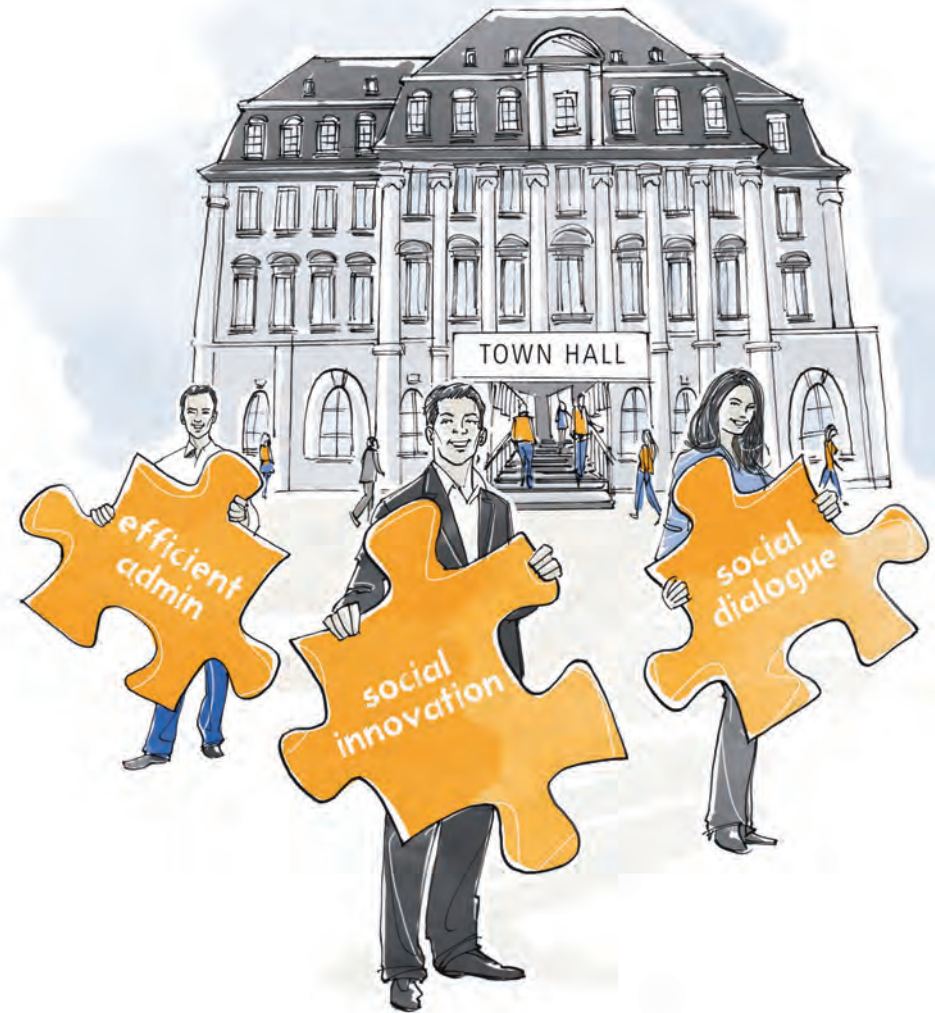
Improves social dialogue and democracy: Collaborative democracy relies on on-line consultation and e-voting for political decisions, or even contributing to writing laws, wiki style. Public participation within the policy-making processes can improve transparency, the quality of decisions, build trust in institutions and inform the public. The dialogue between the public and government increases acceptance of government actions because citizens feel included.

PROVIDES BETTER TRANSFER OF KNOWLEDGE, PEOPLE AND TECHNOLOGIES

Bringing research to market: The public research sector and universities need to discover new channels for research commercialisation. Through contract research or collaborative R&D projects with companies, research institutes can benefit from new financial avenues and improve the market uptake of their innovations.

Industry-academia career pathways: The mobility of researchers between public and private employers helps innovation to spread more quickly for the benefit of all. It also facilitates new career perspectives for students and researchers.

Public-private partnerships: Today, cities and regions are facing challenges in terms of energy efficiency, mobility, security and demographic changes. They need to implement specific technological solutions (i.e. ICT solutions for mobility management), and therefore require access to valuable expertise and state-of-the-art knowledge on technological possibilities, which are provided by companies. Such operations can be implemented through demonstration schemes based on public-private partnerships.



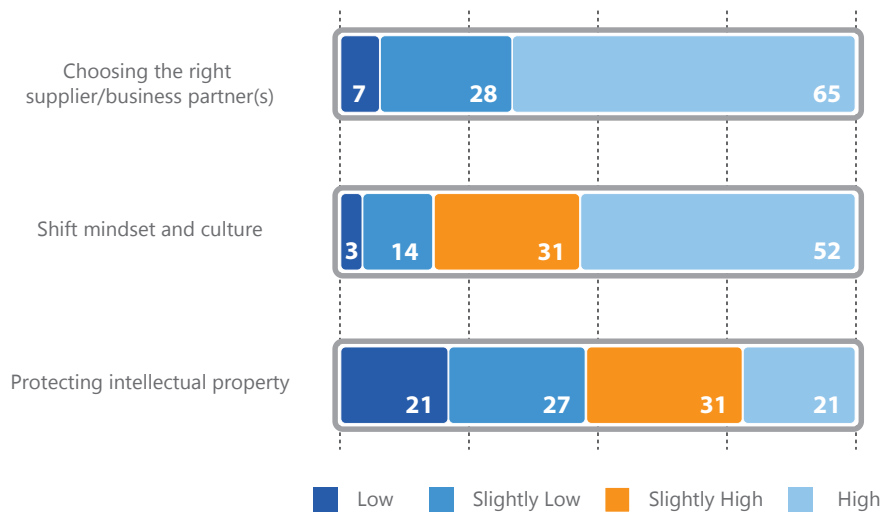
ACE approach to Efficient Open Innovation

We believe that OI works within all functions of an organisation and it should be implemented at the various stages of innovation processes:

→ idea generation → research → development → commercialisation

Given the nature of an OI process, there are obviously a few challenges that organisations need to be prepared to overcome. Surprisingly, intellectual property issues are no longer the major concerns as general perception might suggest. On the contrary, respondents of our recent ACE OI survey confirm that choosing the right partner and changing the culture and mindset inside the organisation are far more important in the current environment (see figure 4 below).

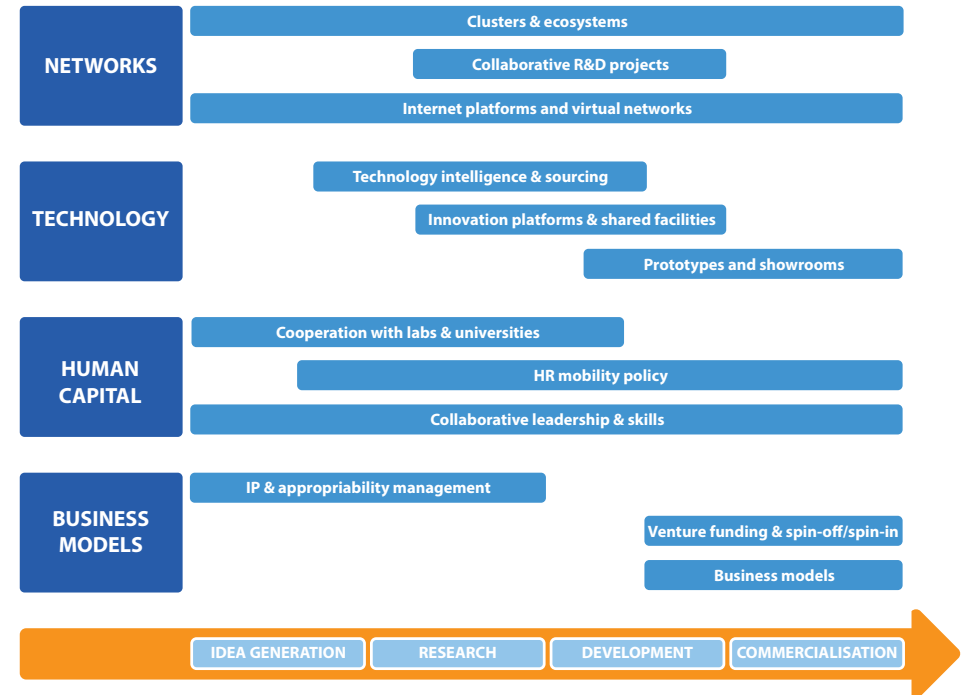
Figure 4: Relevance of different challenges when applying OI



Source: ACE OI survey 2012; n=42 participants

OI is not just about innovating; it's also about making products/services more efficient. To help our clients improve their OI efficiency, we have identified four different levers organisations can tackle – altogether or individually. These levers or dimensions of OI are explained in the following section of this report, under the headlines of: networks, technology, human capital and business model.

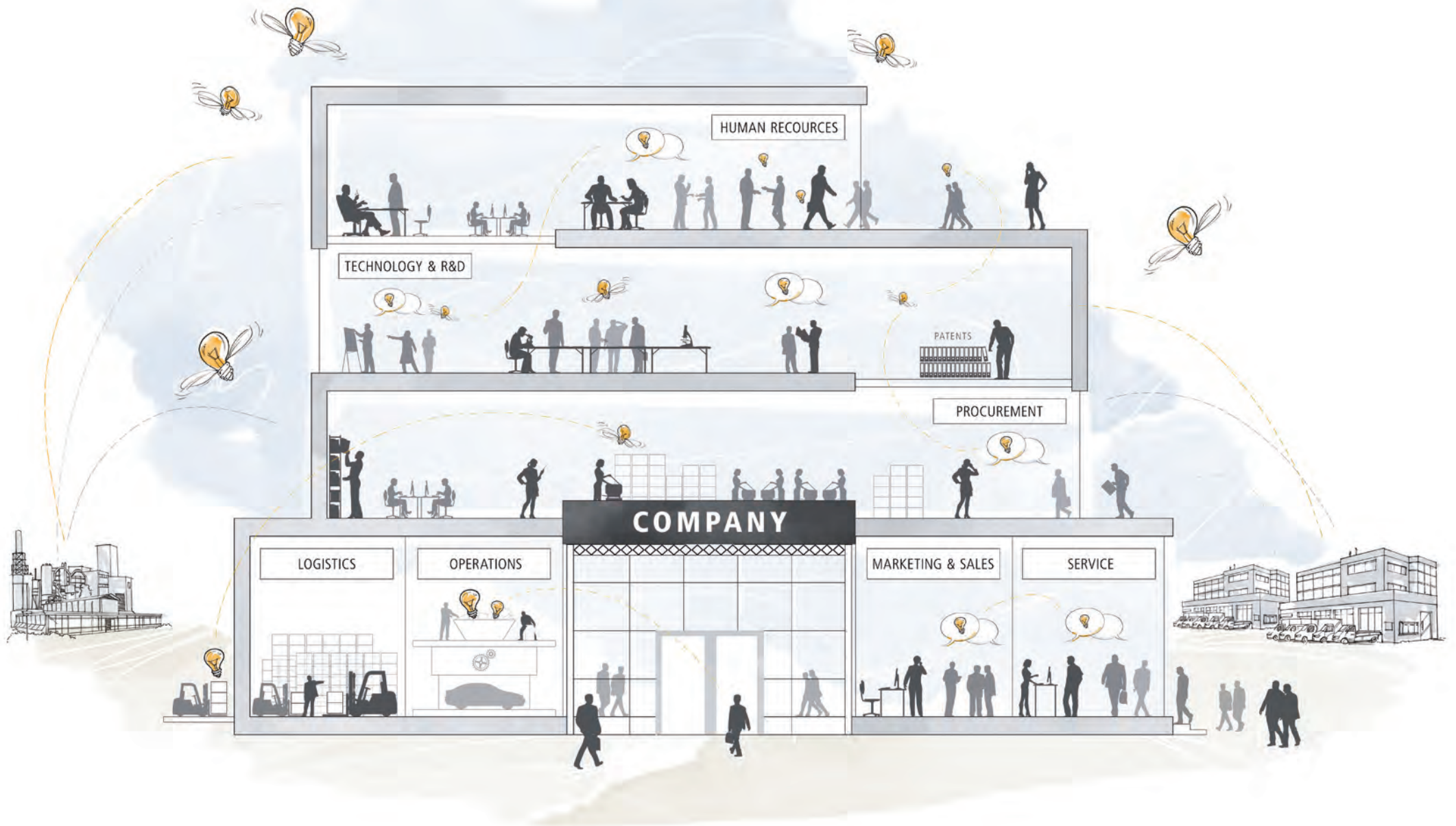
Figure 5: ACE's Open Innovation approach and its four dimensions



Source: ACE analysis 2012

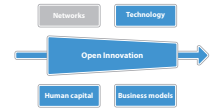
Based on our numerous experiences in European organisations, both private and public, we have described the different aspects of each OI dimension, the challenges you may encounter and recommendations on how to tackle them.

You may find all dimensions important to your actual situation, or perhaps prefer to focus on just one/two areas out of the four. The borderlines between them are not strict, as there are overlapping areas. But we feel confident that all four will give you a good guidance on how to approach OI in your organisation, and how you can potentially profit from the surrounding networks.



The four dimensions of OI: Networks

Clusters and Ecosystems



Networks are collaborative structures that create new patterns of cooperation with a common purpose. They rely on trust and reciprocity for the exchange of knowledge and establish processes, information flows, and relationships required to create synergies between members. Various forms of networks or partnerships (clusters) can be distinguished and there are many different ways in which organisations can work together on OI:

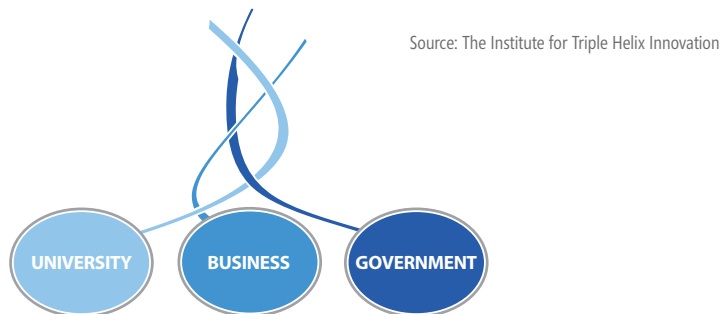
Collaborations in the industrial chain: collaborations between a company and its suppliers and/or customers to develop new products together.

Collaborations within a sector: collaborations between companies to perform pre-competitive research together and/or promote joint services (including marketing, logistics, training, etc.).

Triple helix collaborations: partnerships between science, enterprises and public sector organisations. Such collaborations can be used to strengthen the economic performance of a region, or to open up the (public) knowledge infrastructure.

Virtual networks and internet platforms which are described on p19.

Triple helix collaborations are moving from an arm's-length "philanthropic relationship" towards more strategic, collaborative associations that are more intense and involve joint value creation. This shift represents an opportunity to magnify the value/benefits to all partners, but carries with it greater challenges and managerial demands to accomplish good interaction and boost innovation than the traditional, financial "donation" for a one-off collaboration.



Clusters represent the main playgrounds of OI for companies and public organisations. A cluster was defined by M. Porter as a geographic concentration of inter-connected companies and institutions working in a common industry (such as life sciences, optics, energy, automotive, etc.). Clusters encompass an array of collaborating and competing services/providers that create a specialised infrastructure, which supports the cluster's industry. Business and innovation is the core of cluster activities.

Clusters are based on interdependence: the competitive position of each member of the cluster depends on all other members of the group. They can be classified according to different organisations:

- Industrial clusters which are linked with their buyer/supplier (vertical) or through common customers or technology (horizontal).
- Clusters which are industry driven, university driven, or triple helix driven, according to the role played by their main actors.

The main characteristics of clusters:

According to the European Commission, clusters are groups of independent companies and associated institutions that are:

- Collaborating and competing;
- Geographically concentrated in one or several regions, even though the cluster may have global extensions;
- Specialised in a particular field, linked by common technologies and skills;
- Either science-based or traditional;
- Clusters can be either institutionalised (they have a proper cluster manager) or non-institutionalised.

Thanks to these characteristics, clusters have a positive influence on:

- Innovation and competitiveness;
- Skill formation and information;
- Growth and long-term business dynamics.

Source : EUROPEAN COMMISSION, FINAL REPORT OF THE EXPERT GROUP ON ENTERPRISE CLUSTERS AND NETWORKS

Within a cluster, easy access to specialised suppliers, services and human resources has several benefits:

- Information spillovers;
- Flexibility and fast change reaction due to extreme specialisation;
- Imitation facilitates faster innovation adoption.

Working on OI projects within clusters helps companies and public institutions increase their efficiency and effectiveness by directing services toward larger groups of firms. New leaders can

develop within this context and continue to drive the networks. Clusters are well known for being collaborative environments where job creation and new entrepreneurial innovations are able to flourish more easily. Effective OI in a cluster or a network is not only the result of knowing each other well, but more importantly, of trusting each other. It is therefore vital important to strengthen the

HIGH TECH CAMPUS, THE NETHERLANDS EINDHOVEN

The driving force behind the establishment of High Tech Campus Eindhoven was Philips. At the end of the 1990s, the R&D activities of the company were spread right across Eindhoven. To remedy this, Philips established the High Tech Campus in 1998 to act as a single location for all its R&D activities in the Eindhoven area. Thanks to the proximity of the different departments, knowledge sharing and mutual inspiration generated a boost for the innovative capacity of the organisation. To further accelerate this process, Philips decided to open up the Campus to other technological companies in 2003, inspired by Henry Chesbrough's book on OI. The result was a massive growth of the Campus. More than 100 companies, institutes and other organisations are now present on High Tech Campus Eindhoven, with more than 8,000 staff in total. The preferred work approach at the Campus is OI, which means that Campus companies share knowledge, skills and R&D facilities (such as labs, cleanrooms and equipment) in order to achieve faster, better and more customer-orientated innovation.



High Tech Campus Eindhoven

This approach proves highly successful. The atmosphere of openness and the concentration of high-end knowledge and facilities produce considerable interaction between the researchers. In order to further stimulate the sharing of knowledge, cooperation and mutual inspiration beyond the borders of the individual organisations, all the social facilities, such as restaurants and shops were brought together in The Strip: a central building that has been especially designed to meet these goals.

The Campus contributes significantly to the innovative power of the region. The Eindhoven Region is the heart of the top technology region of Southeast Netherlands and is considered to be one of the most innovative regions in Europe. Located at the heart of Brainport, Campus companies are responsible for nearly 50% of all Dutch patent applications. Today, the Brainport area is considered an important engine for the Dutch economy, contributing 15% of gross domestic product, 30% of industrial employment and almost 40% of the added value of the total Dutch manufacturing industry. Since March 2012 the Campus entered a new phase. High Tech Campus Eindhoven is now an independent organisation, after being sold by Philips to an independent real estate investment and management company.

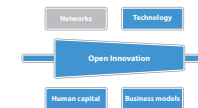
Source: Interview with Jan van den Biesen, VP Public R&D programmes, Philips Research

relationships within the cluster and to focus on efforts to close the gap of trust, such as facilitate meetings and create opportunities for dialogue. When people are better acquainted with each other, relevant content can be exchanged more easily. To support cluster development, we recommend focusing on a framework which is demand-driven, inclusive, collaborative, strategic, and value-creating.

KEY CHALLENGES: CLUSTERS AND ECOSYSTEMS

While dealing with partners in a cluster or other kinds of networks, organisations need to think about several dimensions to harvest the benefits of OI successfully:

- How “open” or “closed” should the network of collaborators be? Open participation (crowdsourcing) is a good choice if firms believe that everyone has assets to offer, and the collection of many alternative solutions is important, even if it becomes expensive to screen them all. A closed network (by invitation only) is a viable option if one knows whom to address.
- Who decides which problems the network should tackle and which solutions to adopt? Hierarchical forms of governance allow firms to choose the direction of innovation, but also leave the related risks on their shoulders, while flat forms of governance (such as consortia) can share them.
- How can external technology be integrated? It requires internal “champions” in order to effectively interact with the many different functions in the enterprise and their partners (see collaborative leadership on page 33).
- Which communication strategies are most suitable to manage the networks? Internal communication is essential to share ambitions, technologies and business opportunities. It needs the use of new technologies (Web, e-newsletters, etc.) for high speed communication, as well as moments of conviviality (breakfast and dinner meetings, for example). External communication is also a way to extend the network and attract new investors.
- Is there an OI culture – with constant commitment of the whole organisation? Firms should be aware of the “Not Invented Here” syndrome which means that its own R&D department often refuses to accept solutions which are not found within their team but come from outside.
- How can the members of the network benefit collectively and individually from the Internet? The Internet – the enabler of this new system of knowledge – provides the answer: web-based platforms are particularly efficient where crowdsourcing is concerned. In the case of a consortia, multi-company R&D teams can run effective trial projects and prototypes (see virtual networks on page 19).



➔ RECOMMENDATIONS: CLUSTERS AND ECOSYSTEMS

- **Identify a relevant strategy and positioning:** a cluster gathers several private and public partners making its marketing positioning difficult to define. We recommend starting with just one market segment or technology to begin with. As the cluster will be growing and consolidating, it will progressively be able to integrate new market targets or technologies.
- **Encourage interaction between participating organisations** to ensure that new topics are tackled and new collaborations get off the ground. In order to assist existing projects, the cluster can function as an independent moderator: the “glue” for the collaboration.
- **Organise a community** where different parties find common ground based on trust. The follow up in concrete projects is often managed either by one of the participating organisations, or by independent project leaders with specific knowledge of project

management in complex network environments.

- **Facilitate territorial landing:** clusters are based on networks, however their participants need to meet as often as possible to facilitate interactions and form a community of innovation. If the network is mature, cluster organisations could help implement incubators, business centres or campus/science parks, which can help to materialise the clusters in a dedicated location.
- **Define a clear task list:** a cluster can take care of prerequisite issues, such as hiring external expertise, and take care of subsidiary or liability issues such as intellectual property (IP). The most developed clusters usually dedicate a substantial part of their resources to support collaborative innovation projects, entrepreneurship and investments in startups.

There is no best solution – different trade-offs have to be evaluated each time:

PUBLIC-PRIVATE PARTNERSHIP, THE NETHERLANDS TIFN FRIESLANDCAMPINA



FrieslandCampina is one of the world's largest dairy cooperatives. It has 15,300 member farmers in the Netherlands, Germany and Belgium, and more than 130 years of experience of

cooperative entrepreneurship. The member farmers own and supervise the company. FrieslandCampina employs 19,000 people in 25 different countries. Their activities are concentrated in operating companies, where similar companies are grouped into business groups.

FrieslandCampina and Open Innovation

FrieslandCampina thinks that it is important to innovate with partners either in the supply chain or in its network in the food industry. The term OI suggests the innovation process is characterised by full openness and transparency between partners. It does not actually work out like that. They characterise what they do as co-development or co-research. For this type of cooperation it is essential that FrieslandCampina participates in Open Networks. These networks function as a continuous motor for new collaborations. FrieslandCampina participates in several public-private partnerships for OI. The most important clusters are CCC

(Carbohydrate Competence Centre), TIFN (Top Institute for Food & Nutrition – see opposite) and Food Valley (region Wageningen). Their main focus in these collaborations is strategic knowledge generation. Their internal organisation around OI is set up in such a way that it is stimulated to work with all relevant disciplines (procurement, commercial disciplines, development and research) very early in the innovation “funnel”.

Challenges for FrieslandCampina:

1. Researchers need to develop a more open mindset: If they are confronted with a challenge, they tend to go and find their own solution. Open networks give them the opportunity to exchange with other researchers to find out whether the solution is already available somewhere else.
2. How to keep the right balance between short-term and long-term priorities: It is crucial to define what kind of long-term R&D is needed to stay successful in the future. Collaboration helps to stretch the term for technology roadmaps.
3. How to find the balance in closeness and openness of the

partnership and its boundaries: It is extremely important to define the goals of collaboration and the use of the results in the right way.

Top Institute for Food and Nutrition in the Netherlands (TIFN)

True innovation goes hand in hand with fundamental research. They are enabled, accelerated and enriched by collaboration. This vision provided the founding principles for the establishment of this public-private partnership. TIFN conducts interdisciplinary studies that individual companies or knowledge institutes cannot manage alone. A structured and well-defined review system ensures research activities meet the criteria of industrial relevance and scientific excellence. The reach of the partnership continues to grow and now embraces a number of large national and international collaborations.

ACE Involvement: ACE Holland, Rijnconsult, has been working with FrieslandCampina over a considerable period of time. Subjects vary from advice on the innovation strategy to helping them to build consortia.

Source: Interview with Wouter Noordman, R&D manager Open Innovation

Collaborative R&D projects (national & European)

Collaborative research and development (R&D) projects bring together science and industry to promote, facilitate and accelerate technological innovation efforts. They involve an interdependent exchange process between organisations, such as private firms, universities, private or public research laboratories, suppliers, competitors and customers, from the same/different countries. Generally, the more complex and multidisciplinary the research and development process is, the more important it is to join forces and share the necessary knowledge, costs and risks.

National government agencies, therefore, allocate R&D subsidies to take an active role in designing and establishing collaborative R&D support programmes. At the European level, multiple funding schemes provide financial support for transnational research for organisations wishing to innovate and enhance their investment in research activities. Some of the most prominent examples include: the Seventh Framework Programme for Research (FP7), the Competitiveness and Innovation Framework Programme (CIP), Eureka, Eurostars, the Ambient Assisted Living programme (AAL), as well as the European Institute of Innovation and Technology (EIT).

Benefits for different players involved

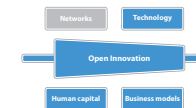
Latest scientific knowledge and expertise in specific technological fields can be acquired or exchanged through collaborative R&D projects. The benefits gained, as highlighted in the table below, vary according to the stakeholder's standpoint:

- **Private firms** primarily are interested in commercialisation of R&D results, thus generating net profit. Firms cooperate with universities primarily to get access to complementary resources, such as tools and machinery, which are not available in-house for cost reasons. SMEs, and young firms in particular, aim to obtain resources such as skills, equipment, specialised knowledge, capital, business networks or intellectual property rights (IPR).
- **Science actors** focus on enhancing scientific knowledge, acquiring financing resources, gaining new insights for their academic activities, as well as improving their visibility in the broader scientific community.
- **Policy makers** regard research and innovation as a means to support sustainable growth, as well as the attractiveness and competitiveness of the economy.

Different stakes in the collaborative R&D projects from the triple helix perspective

Different interests	Science	Enterprises	Policy-makers
Support for innovation	Insights on the market needs	Reduction of R&D costs and uncertainties	Growth of companies with impact on jobs & attractiveness of territories
Generate revenue	Commercialisation of conducted R&D activities	Open up new markets	Further investment possibilities
Access to new knowledge	Complementary views from other disciplines/experts/applied company knowledge	Access to newest scientific results from research & academia	Getting data and insights for making informed policy decisions on future R&D investments
Intellectual property rights	Profiting from intellectual property developed in research	Exclusivity rights for certain sectors or geographical areas	Benchmark of territorial innovation performance
Scientific publications	Research results that can be disseminated	Knowledge spill over from academia	Insights on promising scientific and technological fields to be supported through policy measures
Recruitment of new employees	New opportunities for changing career pathways between science and private sector	Direct contact with researchers as potential employees	Better access to human capital from the private sector and academia
Enhanced visibility	Recognition among the scientific community	New business contacts and networks	Upgraded Image as "territory" of excellence and innovation

Source: Adapted from Dr.-Ing. Andreas Stratmann, vice president of Robert Bosch GmbH



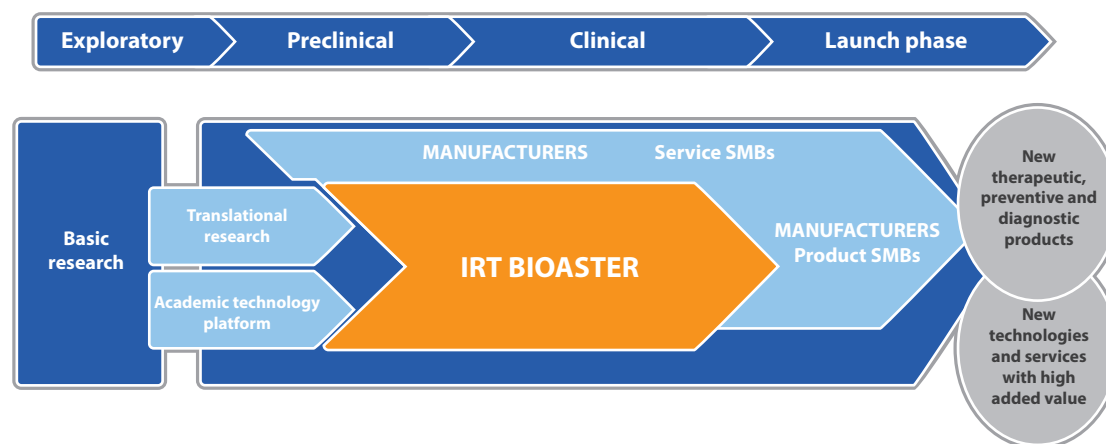
TRIPLE HELIX COLLABORATIONS, FRANCE TECHNOLOGICAL RESEARCH INSTITUTE BIOASTER

IRT BIOASTER is a technological research institute based on a novel public-private partnership model in France initiated in 2011. Its aim is to anchor healthcare industries in Lyon and Paris, and foster the emergence of medium-sized companies in promising sectors of the future, whilst responding to public health challenges related to infectious diseases (14 million deaths p.a. worldwide caused by infectious diseases).

This ambitious project has been selected following a competitive procedure within the framework of the "Investments for the Future", a programme financed by the French government. It also enjoys

strong support from the local authorities – in particular Greater Lyon and the Rhône-Alpes region. The interest of public actors is grounded in high stakes concerning the potential scientific and socio-economic impact of this project: its global market size was €109 billion in 2010, with strong future growth potential. But in order to create value and jobs in France, this sector needs to assert its leadership in high potential markets and improve its R&D performance, which is still held back by an approach that is too compartmentalised between the scientific disciplines and the public and private stakeholders.

To tackle these challenges, the IRT BIOASTER co-leaders, Lyonbiopole (a worldwide competitiveness cluster) and Institut Pasteur (world-renowned biomedical research organisation) joined forces with other stakeholders including: three major industrial companies (Sanofi including Sanofi Pasteur and Merial, Institut Mérieux and Danone Research), three research institutes (INSERM, CEA, CNRS) as well as one non-profit organisation of over 50 SMEs from Rhône-Alpes and Paris regions. Together, these players aim to become a federation, within 10 years, comprising nearly one thousand researchers and associated staff in order to reach a critical size and international scope.



Source: Lyonbiopôle, project presentation 2011

The resources deployed in the framework of the project comprise three "product-orientated" R&D programmes, five technological platforms, 40 R&D projects to be launched in the first three years, and €145 million invested by private stakeholders and local governments. Moreover, perceiving itself as an intermediate partner between education and the industrial fields, the IRT envisaged launching several training and education programmes on innovative entrepreneurship, industrial personal development and on clean techniques.

ACE Involvement: ACE France, Algoé, has accompanied Lyonbiopole and its partners through the development of this R&D project proposal and its subsequent implementation. The objective was to help the consortium to define the strategic positioning of the project, its potential socio-economic impact, to translate its scientific objectives into concrete R&D projects, as well as to develop a business plan for the institute and an appropriate valorisation strategy and governance.

KEY CHALLENGES: COLLABORATIVE R&D PROJECTS

- **A multitude of actors and cultures:** Collaborative projects involve various partners, in some cases, from different countries, including individuals such as experts or consumers, research organisations (universities, public and private R&D centres) and business partners, such as big enterprises and SMEs. These require mutual trust and awareness of each partners' working approaches.

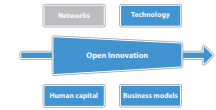
- **Different interest groups:** The management of collaborative projects is a careful balancing act between various interest groups, including public versus private, different levels of the value chain, SMEs and large companies, and different regional representations.
- **Intellectual Property:** IP theft is particularly a major risk and the collaborative context makes it mandatory to clarify each partner's IP rights. Setting up legal agreements sometimes involves long and complex administrative procedures, but ultimately, it's worth it.

- **Strong, medium-term commitment:** It means that each partner has to put in place internal mechanisms to efficiently realise the assigned parts of work (often called “work packages”), as well as clear communication channels and nominate accountable leaders for the work to be delivered.

➔ RECOMMENDATIONS: COLLABORATIVE R&D PROJECTS

- **Clarify the motivation:** It is necessary to invest substantial financial and human resources in a collaborative R&D project, hence all partners need to be sure that it is in line with their main activities and will bring clear advantages.
- **Get top management behind the project:** If the management board is interested in the activities of the project, they will be carried out successfully and efficiently. Should any conflicts arise, decisions can be taken quickly as the leader of the company is familiar with the specifics of the project.
- **Respect IP issues:** Standard Consortium Agreements need to be discussed and agreed. They can be easily found on the Internet and adapted, e.g. by clauses that place restrictions on partners’ activities in order to mutually protect them. These restrictions may apply to collaboration with other organisations, geography of application, market entry dates, etc. You can ask for help from your internal legal affairs department, EU’s IPR helpdesk or IP consultants.
- **Define the complementary competencies needed:** If the consortium is too small, it may lack the necessary capacity to generate the expected impact in scientific and economic terms. On the other hand, if it is too large, the costs may increase disproportionately. Therefore it’s vital to find the right partners, who can complement existing competencies.
- **Get experience:** Join a small project with an academic/company contact before taking part in larger, collaborative R&D projects at a European level, such as FP7 projects. If you haven’t been involved in such activities before, it’s better to participate as a partner at first, and only consider the role of leader much later on, after you have acquired significant administrative and management skills.





Internet platforms and virtual networks

The various OI platforms can be differentiated using the following categories:

Platforms for collective intelligence that use contributions of the crowd to enhance the pool of existing knowledge in terms of quantity and quality of ideas. This type of platform can be used for problems related to research and development tasks (e.g. InnoCentive, IdeaConnection, Yet2.com, NineSigma) or marketing and design of products (e.g. CrowdSPRING, OpenIDEO). Some platforms function as marketplaces for human capital and recruitment (e.g. Yourecore which connects about 800 retired scientists and engineers with client businesses) or intermediary services, e.g. Innovaro Pharamlicensing in the field of life sciences.

Platforms for crowdcreation can be used to gather users for the creation or design of products, (e.g. Jovoto, Quirky, UnserAller). This type of platform is especially suitable for the design and configuration of consumer-orientated goods, such as foods or fashion.

Reporting and voting platforms that organise consumers into a community of registered users who report on new products or new trends, e.g. trendwatching.com which brings together over 8,000 trend spotters worldwide to supply the companies with observable changes in the market supply of consumer demand.

Platforms for crowdfunding enable financing of projects and people by large crowds. They occur for a variety of purposes, from disaster relief to citizen journalism to investments in startups. An example of this type of initiative is StartupAddict, a crowdfunding for startups and entrepreneurs to raise money for their projects.

Peer production platforms in which the creative energy of a large number of people is concentrated on generating information and sharing data. These projects take place without traditional hierarchical structures and are often conceived without financial compensation for contributors. YouTube, Wikipedia and Facebook, for example, are based on peer production.

The new web-based form of OI is associated with the term "Crowdsourcing":

It is the act of a company or institution taking a function once performed by employees and outsourcing it to an unknown (and generally large) network of contributors called "the crowd" (Howe 2006). The crowd's role is principally to submit, and in some cases, to value solutions.

Many platforms are organised by putting in place so called idea contests, challenges or open calls for solutions addressed at an online community environment. Every innovation contest is initiated by an organiser (crowdsourcer) who formulates the problem, lays down the rules for participation, usually collects the contributions, evaluates them and then chooses the winner.

Any products or solutions generated by the crowd become the property of the organiser. Usually, the crowd participants are amateurs or volunteers working in their spare time or experts or small businesses. The work can be undertaken by sole individuals or be performed collaboratively. The winning individuals in the crowd are sometimes rewarded by the organiser, either financially, with prizes and/or with recognition for the work done. In other cases, the only rewards may be fame, benefit for one's career, social feedback or intellectual satisfaction.

The potential of crowdsourcing can be leveraged by both, private and public sectors:

- Corporate crowdsourcing for product ideas, branding and design have seen initiatives such as GE's ecomagination challenge (powering the grid, powering your home), Roche Diagnostics' experimental project to harvest bright ideas, Procter & Gamble's Connect and Develop programme and Swarovski's watch design contest.
- Public crowdsourcing platforms include, for example, iBridge Network (platform for university innovation), Picnic Green Challenge (ideas to save the planet) or Imagination for People (platform on social innovation).

Clear benefits: Pace, creativity and customer commitment

- **Faster paced innovation:** By tapping into the crowd, these platforms can help to accelerate a company's innovation processes. The reason for this is that, in most cases, the winner just reused an existing solution from a previous task he/she solved in a different context in another domain. The example of InnoCentive shows that, on average, a winning solver spent just 74 hours to solve the problem, compared to six months to

two years typically spent by big corporations on searching for solutions internally.

- **New, unbiased ideas and validated concepts:** Companies using the platforms are convinced not only by the quantity, but also the quality of ideas. In the case of Roche Diagnostics, the challenge has resulted in more than 100 proposals from around the world. But what seemed to count even more for the managers, was the level of detail: "Many [ideas] were multiple pages. Some people had done experiments. There were diagrams. There were drawings that filled an entire notebook. We would have been delighted if we could have got much of the work out of our own research organisation."
- **Better image and customer commitment:** Contests also are a method for identifying innovative customers (lead users) who will undergo a two-sided selection process: self-selection decision by the customers who wish to participate in the contest and a selection based upon the results of the evaluation of the contributions by the evaluating body (performance selection). Brand ambassadors can be found and activated in web 2.0 even before the product has been launched on the market. In addition, these platforms help companies to foster the image of being an innovative and progressive player.

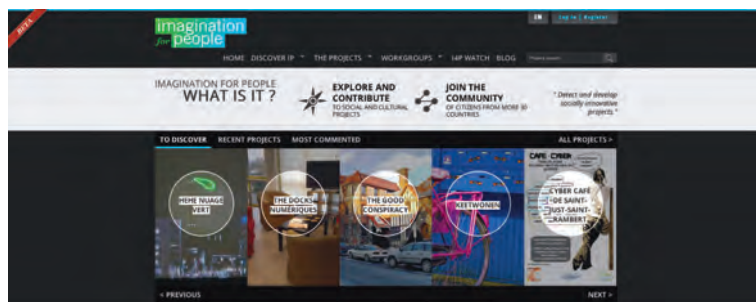
CROWDSOURCING, FRANCE/CANADA IMAGINATION FOR PEOPLE

Imagination for People is an example of a crowdsourcing platform on social innovation. It brings together a community of citizens and public agencies around the world who aim to find practical solutions that serve the common good.

The goal of Imagination for People is twofold. Firstly, it identifies innovative projects from different countries that showcase the imagination of citizens. This includes projects being carried out by individual entrepreneurs or communities, visionary public organisations and pioneer companies.

Secondly, Imagination for People aims to support social entrepreneurs as they start up their projects by giving them access to upcoming collaborative tools that will allow them to mobilise a global movement of collective inventiveness.

To do this, Imagination for People has set up a web-based platform that is creative, collaborative, multilingual and experiential. The platform brings together a first sample of creative social projects identified by an emerging community. Themes addressed by the communities include healthcare, education, smart cities, urban design, economic development, urban mobility, solidarity between generations, etc.



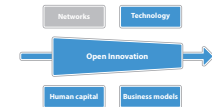
Source: <http://imaginationforpeople.org/en>

Disruptive techniques for facilitating collaborative working groups like this allow members of the platform to lead discussions, moderate virtual meetings, co-edit their documents in real time, visualize the results of knowledge collectively produced and help launch challenges for ideas.

ACE Involvement: ACE France, Algoé, is an associated partner of this platform. Algoé's support for Imagination for People is part of its corporate social responsibility (CSR) policy and at the same time allows its customers to share and disseminate their projects on the platform.

KEY CHALLENGES: INTERNET PLATFORMS AND VIRTUAL NETWORKS

- **How much detail to provide:** As the quality of answers is usually related to the quality of questions, one of the most difficult problems is figuring out exactly what question(s) to ask, and how much detail about the challenge should be provided.
- **Finding a diverse audience:** In practice the crowd seems to be rather undiversified, representing a young age group that is most active in the web 2.0 environment of massive content creation, such as bloggers. Targeting diverse audiences is a key issue.
- **Qualified jury:** After ideas or solutions have been submitted, they have to be screened, evaluated and ranked. Filling the seats of the assessment committee often occurs unsystematically and arbitrarily. The choice and use of suitable evaluation methods suffer under these conditions too.
- **Providing attractive incentives:** The success of the project heavily relies on the crowd's participation. In order to trigger participation, it is necessary to thoughtfully plan and discuss the appropriate award as a promise of a fair and valuable recognition.
- **Right culture and internal support:** No amount of idea hunting on the outside will pay off if, internally, the organisation isn't behind the programme. A change of an internal culture is crucial, meaning actively promoting internal idea exchanges and implementation processes, e.g. shift mindsets away from resistance and the "not invented here" mentality.



CROWDSOURCING, DENMARK LEGO MINDSTORMS

In 1998, LEGO released LEGO Mindstorms, which was a new set of LEGO robots centred around a programmable microchip that allowed a long range of movements and behaviours. The product became an instant hit and 80,000 sets were sold in the first three weeks. There was just one thing LEGO didn't foresee: customers were not children, but adults. Within weeks hackers from around the world had cracked the code and made their own toys and applications.



At first, LEGO reacted in a defensive way stating that users should consume, not develop their own products. They were not meant to challenge LEGO's in-house product developers. However, a year later, LEGO began to look closer at this community of users that had evolved around LEGO Mindstorms and began to understand their needs and interests. Some were into fantasy and science fiction, while others were into real-life models, such as trains and suburban life. LEGO realised that this community was key to identifying future trends and develop its products further.

Inspired by the drive and passion of the LEGO Mindstorms community, LEGO decided to announce a group of LEGO ambassadors and invite 20-25 fans to the LEGO headquarters each year and ask for their input to new product development and ideas in general.

Today, LEGO acts as a guiding example of how companies can open up their innovation departments and collaborate with users.

Source: ACE research 2012

RECOMMENDATIONS: INTERNET PLATFORMS AND VIRTUAL NETWORKS

- **Careful planning and design of the challenge is vital:** The target group and the duration need to be defined and the appropriate platform provider has to be chosen. The definition of incentives by the producer/platform that would attract the most valuable users is a very important issue. It is also necessary to take into account the nomination of the jury members, as well as the assessment criteria for the evaluation of ideas. The description of the challenge should provide enough detail and structure so that someone who isn't familiar with the subject, could still get involved. Finally, the legal issues, particularly related to IPR, need to be clarified.
- **Test the launch and implementation phase:** The platform needs to be tested on a number of people corresponding to the main target group before the public launch to adapt and improve the contents. Marketing activities such as web and print ads, radio commercials and frequent press coverage can help drive traffic to the platform. It takes time for the promotion to reach the necessary target groups, so between eight and 10 weeks are recommended for the duration of the contest. Finally, constant monitoring and updates are a must.
- **Let the jury assess the ideas and prize awards:** The jury teams can be composed of internal staff and external experts. Alternatively, user votes can also determine the community's most popular proposals on the platform. Organisations should combine the collective input gained during the challenges with their tacit knowledge about technical constraints and market reception to interpret customer evaluations. The commitment and involvement of the management team is critical to make effective use of the ideas to improve/develop products and services.
- **Make the platform experience fun:** Incorporate playful features to encourage participation, e.g. voting and collaboration tools, integration with google maps and data visualisation applications, mobile smartphone applications, possibilities to share ideas on Facebook, twitter and YouTube, craft and inspiration sheets or configuration tools for the determination of colours and materials (in the case of design projects).

The four dimensions of Open Innovation: Technology

Technology intelligence and sourcing

Firms are not isolated entities and therefore their innovation processes have never been completely closed. Early supplier involvement (ESI) is, for example, a practice implemented well before the OI paradigm. So what has changed and what has determined the success of OI, especially in technology innovation? Two major trends are relevant:

Firstly, the system of knowledge has radically changed and most firms do not have the right map to guide them anymore. In fact, before there were few, well-known centres of competence, but now there are many interconnected and scattered ones. Moreover, their ease of interconnections has enabled a deep cross fertilisation among these centres, which has resulted in new areas of knowledge that require multiple and distinctive competencies. Knowing who/what to apply to solve an issue is not an easy task anymore.

Secondly, consumers' needs have now become increasingly complex and sophisticated, and to satisfy them new products need to be complex or highly technical too.

In this context, practices such as ESI need to be assessed from time to time to make sure the balance between a trusted cooperation and creative/innovative input is still in place. Sometimes, external innovators whilst developing long lasting relationships with their counterparts tend to "enjoy the warm nest of existing relationships" (Innovationexcellence.com; Using open innovation in long term technology strategy; Frank Mattes). They might adapt themselves to the firm's own culture bringing ideas in an easy-to-digest way for the firm, but the quality of innovative ideas from these external contributors decreases over time.

Based on our experience, firms may successfully look at OI with three goals in mind:

- **Technology intelligence** an activity that enables companies to identify the technological opportunities and threats that could affect the future growth and survival of their business.
- **Technology sourcing and procurement** activities that enable companies to identify external technologies or equipment that fit with business objectives and are thus candidates for purchase, potential licensing or intellectual property acquisition.
- **Technology transfer** a process of transferring skills, knowledge and technologies from one organisation to another to ensure that scientific and technological developments are accessible to a wider range of users who can then further exploit it.

Once a business/market need is defined, or a technical challenge is determined, external scanning for a solution can get to market faster and cheaper. At the same time it can minimise risk by investing in technology that has already proven to work in other applications.

TECHNOLOGY INTELLIGENCE, SWEDEN INWIDO DOORS AND WINDOWS

The Swedish window and door manufacturer, Inwido, wanted to explore the value of OI and decided to invite suppliers, universities, start-ups and other external parties to a competition on developing new solutions for the digitalisation of doors and windows.

More than 20 different companies collaborated and competed in an intensive 10-week competition for developing the best new solutions.

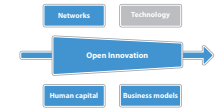
At the end of the kick-off workshop, 16 project teams had emerged and over the following weeks the teams met every week to develop their ideas further.



At these Thursday-meetings, Inwido provided all the participants with guidance, feedback and a new inspirational speaker each week, who challenged, provoked and inspired the project teams.

At the end of the 10 weeks, all teams presented their solutions to a selected jury of Inwido managers and external consultants. Out of the 16 solutions presented, four were picked as winners and Inwido chose to pursue all of them. The ideas are mainly centred around new functions in windows and doors based on electronics and nano-techniques. In just 10 weeks, Inwido got concrete input for new products or services, access to these entrepreneurial specialists, and inspiration that may otherwise have taken years.

ACE Involvement: ACE Denmark, Implement Consulting Group, accompanied the client through the process of OI. The role of Implement was to analyse and facilitate the entire OI process from start to finish.



KEY CHALLENGES: TECHNOLOGY INTELLIGENCE AND SOURCING

- Technology intelligence and sourcing implies adequate means to test technologies and identify their benefits or limits in the long term (test platform). This is especially relevant for new technologies with little feedback.
- The integration of the external contributions into the R&D department has to be managed carefully. Managers need to prevent the accidental consequences of the NIH (Not Invented Here) syndrome sometimes leading to rejection of the technology due to wrong certainties rather than strict technological analysis and testing.
- At the beginning, collaboration with new and multiple partners, despite being potentially beneficial, will require a great coordination effort, which has to be managed in the most efficient way possible.

RECOMMENDATIONS: TECHNOLOGY INTELLIGENCE AND SOURCING

- **Ask the right questions:** When it comes to getting input and inspiration to overcome specific problems in technology development or R&D activities in general, companies often find good answers – but usually to the wrong questions. It is essential to identify objectives and some key criteria for what the new technology or product must be able to do (i.e. which problems must it solve and which needs must it satisfy?).
- **Scout for analogous markets** with the same problems, needs and trends as found in one's home industry. Cross-sector collaborations often generate the most attractive and high performing technological innovations (as the Rossignol case study opposite illustrates).
- **Rotate partners you innovate with,** as it will help to develop new and unexpected methods to successfully tackle issues. We do not recommend changing partners for every new project but to manage a portfolio of partners with various profiles and competencies. One should also consider with interest every solicitation before making any decision on potential collaborations.

TECHNOLOGY TRANSFER, FRANCE ROSSIGNOL

Technology transfer can consist in transferring scientific findings from one sector to another. Technological transfer from the aerospace to the sports sector can be illustrated by the case of Rossignol, the French ski maker which succeeded in stabilising skis by a mechanism originally developed for the European Space Agency (ESA).

In fact, one of the most important factors in slowing down speed skiers is vibrations. In 2004, Rossignol carried out a research project on the heat zones and peak temperatures to understand how friction transforms snowflakes into water droplets. The influence of ski vibrations on the water film and different damping coefficients were further investigated. Consequently, a vibration control system has been developed to control the ski vibration, to get the best water film thickness, and to maximise gliding conditions.



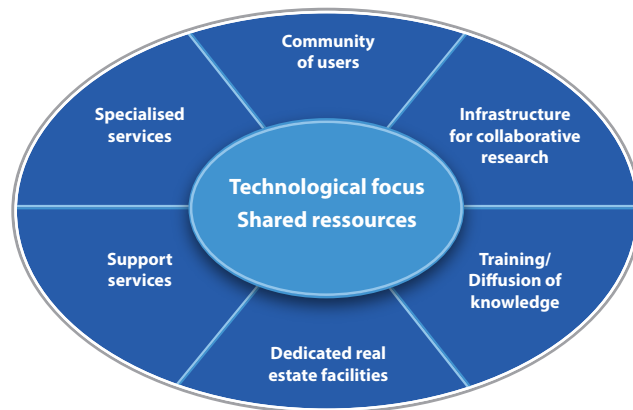
The heart of the system is an amplified piezo-actuator developed for ESA and the French Space Agency CNES for space applications. In fact, this technology has been used on the MIDAS instrument aboard ESA's Rosetta comet chaser.

Source: ACE research 2012

Shared infrastructures and R&D facilities

Innovation platforms are designed to provide open access to shared resources, such as research infrastructure, training resources, dedicated real estate facilities, specialised support services, as well as a community of users. Within the technology/scientific field, they provide a possibility to carry out R&D and innovation projects, trials and tests, prototypes and/or pre-series, or even serve as laboratories of practice or “living labs”.

Figure 6: Key elements of innovation platforms:



Source: ACE analysis 2012

From the OI point of view, these platforms are an invaluable tool for creating an environment, which promote interactions, networking and sharing of costs, risks and knowledge between various actors in the innovation system. This can help companies bring innovations to market more quickly, often with positive “side effects” such as collaborative R&D projects among participating companies. High-tech companies in the platform can also more easily “spin in” ideas from other companies in the platform or “spin out” technologies from their own IPR portfolio. Finally, platforms are ultimately intended to meet major economic and societal challenges, such as strengthen market position, ensure employability of researchers, enhance international visibility, etc.

Different actors, different shapes...

It was built on the desire to use a larger number of government “levers” to encourage and support innovative activities of UK companies. Today, these platforms take various shapes. They can be public-private (gather public research organisations and private companies), be open to the members of clusters, target SMEs or exist solely between private companies. Some companies invest in shared R&D facilities together with partner companies, suppliers and companies in other industries requiring the same facilities, or even competitors. For example, in creative industries, design firms have created platforms for sharing and co-creating brands, advertisements, designer clothes, etc, whilst technology firms are collaborating to develop emergent technologies.

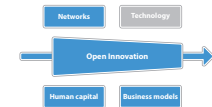
There are four types of mutual innovation platforms:

Providers of services in the field of R&D: The major objective of this platform is to diffuse innovation among SMEs (logic of local economic development). This platform includes an educational objective (professional training programmes) and is usually backed by a public institution (higher education, public or private structures). The sharing of public funding remains dominant in the budget of this platform.

Public brokers of technology transfer: This platform is established on a combination of routinised tasks and experimentation devices backed by research teams. The transfer activities aim to enhance the scientific backing of the structure concerned. Qualified personnel is hired by the organisation or delegated by one of the partners to conduct research, commercialise and deliver services. This model can be extended to the valorisation of spin-offs, as well as to incubation facilities and services. Public funds are predominant in this model and are matched with incomes related to sales of services.

Operators of real estate and dedicated technological equipment: This platform enables host projects in private spaces, designed or adapted for specific applications in the field of the innovation platform. Projects hosted pay rent to enjoy the benefits offered including the rental of their private spaces and the use of shared equipment. The facilities are owned by the platform/ external partners.

Territorial experimentation sites/the “Living Labs” model: This model is based on tests of services, tools and new usages “in nature size”. The key differentiator to other platform models is the direct association of the “end users” early in the design of new technologies/new services that are specifically related to the information technology. In addition, a territorial dimension is included in the concept of this platform (test site and transfer of knowledge to the territory). The business model is complex because it relies on extensive business networks, multi-partners and potentially multi-sites.



KEY CHALLENGES: INFRASTRUCTURE AND SHARED R&D FACILITIES

- **A local community as a co-developer:** The performance of the platform depends on the critical mass of scientific expertise from both, academia and the private sector. This should be coupled with a focus on markets with growth potential and consideration of industrial needs. For the Living Labs especially, the community is one of the leading actors involved in the development of a platform. It is often the initiator of the platform, and plays an important role in the launch phase and the subsequent deployment of this structure.
- **A selection process of R&D projects driven by the market:** Selection procedures should be based on an evaluation grid using a multi criteria scoring system that takes into account the scientific contents of the project, the credibility of coordinators, the estimated turnover, the time to market, the international dimension, etc.
- **A platform embodied by an entrepreneurial director:** The profile of a director requires a double qualification in scientific expertise and entrepreneurial management. The ability to manage a team of high level researchers is crucial, as is the ability to raise funds and resources necessary for the realisation of projects incubated on the platform.
- **A clear strategy on intellectual property (IP):** The management of IP should be treated right from the start of cooperation and lead to the definition of rules on how to share the platform. The corresponding IP strategy depends on the type of research activities in question (precompetitive or competitive), and on the project type (platform's own project, collaborative project or project undertaken by a single partner with an exclusive right to its application domain).

SHARED R&D PLATFORM, GERMANY/FRANCE BMW/PSA PEUGEOT CITROEN

BMW is vying for the lead position within the premium automobile sector. Norbert Reithofer (chairman of the BMW Group) aims to exceed the 1.5 million cars sold mark in 2012, with high hopes of reaching the 2 million mark by 2020.



In order to achieve continuous growth, the BMW Group started a Joint Venture with the French PSA Peugeot Citroen Corporation. As the automobile market is currently changing vastly, both manufacturers feel the need for new and innovative ideas. The BMW Peugeot Citroen Electrification (BPCE) is the common effort of BMW and PSA to increase R&D and subsequently the production of hybrid and electronic propulsion technologies like electronic engines, generators and software. They are convinced that thanks to joint research efforts and higher production quantities, they will be able to significantly reduce costs.

BPCE was founded in April 2011 as a shared knowledge foundation and currently employs 400 employees in a research and development centre in Munich, Germany. By 2014, it plans to set up a new production facility in Muelhausen (France) with another 250 employees. BPCE's main objectives include the introduction of new standards for the European market and to strengthen its market position against the Asian competition.



It's hoped that the developed technologies shall first be used in BMW's front-wheel drive models, as well as in the Mini by 2014, after which the new technology can be transferred to bigger hybrids with rear-wheel drive and fully electric models. PSA also wants to use the research results to sell its first 40,000 electrical cars in 2014.

Source: ACE research 2012

➤ RECOMMENDATIONS: INFRASTRUCTURE AND SHARED R&D FACILITIES

- The **technological focus** (positioning) of the platform needs to be well defined and correlated with the market priorities and industrial needs.
- The platform should be based on a broad partnership of stakeholders, including both public and private players. This should be translated into a **collective governance** structure.
- A sophisticated **business model** should be elaborated that does not solely rely on the conditions of access to facilities as well as funding and pricing, but also on the management skills, the range of services, priority rules, and last but not least, the links to the programming of research.
- Robust **quality processes** such as contract management, formalisation of research results and diverse reporting tools, should be put in place.
- It is necessary to clarify the **rules of IP management** at the very beginning to reassure potential industrial users and ensure gains for partners and for the platform as a whole.
- The activities aimed at the creation of the platform should be coupled with the development of a **communication strategy** and action plan to target potential customers.
- The **management of stakeholder relations** should focus, on the one hand, on the cooperation between the founding partners who share a common interest in the platform, and on the other hand, on the establishment of shareholder engagements (in financial and physical terms).

SHARED INFRASTRUCTURE, THE NETHERLANDS LIFE SCIENCES PARK OSS



The pharmaceutical sector is characterised by long-term research, high R&D costs, high investment and strong protection of intellectual property. These circumstances usually do not encourage companies to innovate in an open way. Nicole van Straten, Commercial and Community Manager of Life Sciences Park Oss, believes that there are, however, stages in the innovation process that have advantages to innovate in a more open way.

Especially in the beginning of a new innovation process, when demand is articulated, an OI approach can help to reduce time and investment. This is still a pre-competitive moment, and the involvement of universities for example can represent an invaluable source of insight and knowledge. Then after, when it comes to identify the relevant matches, bigger companies most likely do their own screening hence are less prone to open up their processes. But for smaller organisations in the pharmaceutical sector OI platforms such as the Life Sciences Park Oss described here can be of competitive advantage and speed up significantly their innovation processes. Following phases of the innovation process are most likely less indicated for OI concepts, but the benefits for smaller companies particularly at the beginning of any drug development cycle are significant, stresses van Straten.

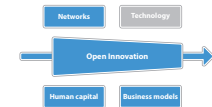


An OI platform such as Life Sciences Park Oss can play a significant role in facilitating drug development. Life Sciences Park Oss for instance aims to house companies that have drugs testing as their core business. Furthermore, Life Sciences Park Oss facilitates a community where entrepreneurs can meet each other; workshops are organised and knowledge can be exchanged easily.

Nicole van Straten, who has long-term experience within MSD and Organon, thinks that OI is also relevant for bigger companies. She believes that “the innovation process can be accelerated through OI. But innovation and development in big companies is a tough process because creativity is not always supported by the long and difficult procedures within large companies.”

ACE Involvement: The development of Life Sciences Park Oss has been supported by the five star region; a regional collaboration which aims to support economic development of the region North Eastern Brabant in the Southern part of the Netherlands. ACE Holland partner, Rijnconsult, carried out the management of the five star region programme over the last three years.

Source: Interview with Nicole van Straten, former Commercial and Community Manager, Life Sciences Park Oss



Open testing: pilot projects, prototypes & showrooms

A part of the open innovation paradigm naturally stretches into involving users in the early phases of product or service development. Frontloading information in innovation projects by prototyping, creating showrooms or making pilot projects is an essential part of this.

The open innovation paradigm addresses a key challenge of R&D-driven companies to raise the efficiency of the traditional innovation funnel. Generally, only a small fraction of the ideas, prototypes, research results and technological solutions generated by the R&D department of a company will successfully pass through all the stages of the innovation chain. Building the complete design is often a risky, expensive and time-consuming activity, especially when repeated several times. The involvement of users allows early assessment of how a potential user interacts with various elements, motions, and actions of a concept, which define the initial user scenario and overall user interest and experience. This allows companies to test the parts of the design that are most likely to have problems quickly and inexpensively, solve those problems, and then build the full design before starting mass production.

Open prototypes

A **prototype** is an early sample or model built to test a concept or process or to act as a thing to be replicated or learned from. It is a term used in a variety of contexts, including design, electronics and consumer goods. The first versions are usually rough. They're early proofs of concepts, "not finished products" and ways of helping to explore, learn and think.

An **open prototype** is one that involves the user in a direct way. It is something you can hand over to a potential customer/user in order to observe them through the process of using and experiencing the prototype. By noticing any points of confusion, pauses, delights or misuse, companies can then investigate what the user is thinking, why the product is or is not intuitive, and even get new insights into how the prototype can be used in other ways than initially intended.

A **closed prototype**, however, is an experience that users watch, but do not interact with directly. The lack of direct user interaction can make it harder to learn from this prototype, but it can also be quite effective.

Fabrication laboratories for everyone

More and more people could soon be innovating and manufacturing on their own and for themselves with a variety of toolkits such as fab labs and open source/design networks. This form of open testing and prototyping might be further encouraged through access to efficient technologies, which help to manufacture solutions designed by the users without having to rely on a company to optimise, produce and purchase it. Even the production and distribution can be carried out by the innovators themselves.

Social innovation camps

These camps are basically experimental events that bring together web developers and designers with "people at the sharp end of social problems" for rapid prototyping. They consist of competitions to find the best ideas for web tools to create social change and a race to build prototypes for them over one weekend – complete with working software. The events finish with a pitching competition and a chance to win a prize, as well as support for making the idea a reality. It is a process that aims to create relationships needed to launch these micro social innovation groups.

SHOWROOM, JAPAN THE SAMPLE LAB!

Tryvertising ("try before you buy"):

This term defines a lab-type environment where potential customers can try the products before they actually buy them. An example of this kind of "retail show-room", the Sample Lab!, is located in one of Tokyo's shopping centres. Basically, it is a store where products are displayed only for demo purposes. Visitors come and try them and get rewarded by taking home some of the products they have tried. In return, they have to complete surveys that help brands, designers and manufacturers to improve and fine-tune their products for the mass market. This form of testing innovations gives consumers a certain degree of choice, whilst promoting the products at the same time.



Source: ACE research 2012

KEY CHALLENGES: OPEN TESTING

The above models used in the field of "open testing" have the potential to provide valuable insights on user interests and needs.

- The success of the products depends ultimately on the **willingness and the capability of users** to provide valuable feedback on the desired characteristics of the products or services.

- At the same time, open testing requires a **change of culture on how and when the products are marketed**. Companies can launch as quickly as possible with a “minimum viable product” – a bare-bones product that includes just enough features to allow useful feedback from early adopters. Firms can then continue hypothesis testing with a succession of incrementally refined product versions.
- It is necessary to find an effective way to target the right cluster of future users in order to avoid misleading feedback.
- Carefully plan to what extent the prototype will be a “not finished product”: prototypes launched in their very early stages could be too rough and could compromise the image of the firm itself in the eyes of the customers.

➤ RECOMMENDATIONS: OPEN TESTING

- Knowing when to use “open” and when to use “closed” prototypes is essential. If you are prototyping a scenario that is too complex for the user to participate in a meaningful way, a closed prototype might be a better option. However, if this kind of prototype is used, it’s critical to keep the demonstration short, so one can spend as much time drawing out the user’s thoughts and feedback. If there is limited time with a focus group or user, the time might be better used interviewing them.
- Generally, participatory, prototype or pilot projects are preferred since they have the potential to bring valuable insights about usability, design and user experience. Open prototypes are especially beneficial when testing new features or functions on products, or during the design phase of developing physical products.

USER-DRIVEN INNOVATION, GERMANY DEUTSCHE TELEKOM

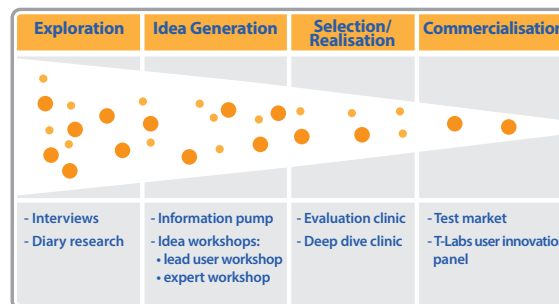
Deutsche Telekom is Europe’s biggest telecommunication corporation, offering technical customer services, technical infrastructures and call services. With an annual turnover of €58.7 billion, they strive to be the pioneers in adopting volatile markets and new technologies.

The telecommunications industry is driven by highly innovative new products and services as the main source of sustainable growth. The necessity to include the customer in the innovation process is widely accepted. To reduce the risk of innovative products and services not being accepted by the customers, Deutsche Telekom Laboratories introduced a User-Driven Innovation concept, which ensures communication with customers during specific phases of R&D and innovation projects.

The Deutsche Telekom Laboratories were created as an institute within the Technical University of Berlin, in order to explore technologies and solutions for tomorrow’s communication, and introduced five research fields where intuitive usability, assimilable service components, intelligent access, development of infrastructure and security of innovative ideas are researched and tested. Two think tanks – Strategic Research Laboratory and Innovation Development Laboratory – were also created. The Innovation Development Laboratory specifically

acts as the pre-amplifier for new products and services. It focuses on the technical and market orientated development and evaluation of innovative ideas, the creation of business models and prototyping in order to analyse potential customer adaptation of product ideas.

The Open Innovation process:



Source: ACE research 2012

Within user-driven innovation there are four phases of an innovation process: exploration, idea generation, selection/realisation, commercialisation;

User-Driven Innovation Example: Mobile Television (Summer 2007)

In 2007, smartphones gained increasing importance within the telecommunication industry. Applications like interactive TV, interactive gaming or interactive shopping appeared to be very promising. Mobile television showed especially high potential for the near future. But the industry was aware that innovative ideas, such as mobile television, would only be a success if customers were prepared to change their consumption habits.

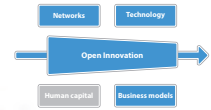
Within the first two phases of the innovation process, Deutsche Telekom Laboratories worked with a group of highly innovative lead users. They represented the needs and skills of tomorrow’s customers and tended to be the first to adopt innovative technologies. After a period of 10 days, 57 possible situations, in which mobile television would be handy, were identified.

The most promising ideas got selected and simulation prototypes were created and tested with the help of 180 potential customers. Because of the simulations it was possible to identify likes and dislikes, as well as possible improvements in handling the application and planned services.

The four dimensions of Open Innovation: Human capital

Open Innovation Culture

Human Capital focuses on “soft factor” human resources and follows the overall objective to create an OI culture. This implies a significant shift in mindset of employees but also external partners. The greatest obstacle is the NIH (not-invented-here) syndrome, which organisations have to overcome if they want to implement OI strategies successfully. But there are more, essential elements one has to consider in one’s effort to achieve an OI culture as the overview below demonstrates.



OPEN INNOVATION CULTURE: 10 ESSENTIAL ELEMENTS:

1. **People who can manage relationships with customers and partners:** If you’re going to open up your organisation to ideas from the outside, then you need “agile people who have the soft skills of emotional intelligence”.
2. **A willingness to accept that all of the smart people do not work for your company:** At the same time, to be successful at OI, your organisation’s culture must not only accept this idea intellectually, but also have a willingness to seek out these external ideas.
3. **An understanding that failures are opportunities to learn, and a willingness to reward those efforts and that way of learning:** “Failure is a way of life for companies that pursue innovation seriously, and a leader’s response has a huge effect on company culture and, therefore, on future projects.”
4. **A willingness to help employees to build the knowledge and understanding of how an idea or technology becomes a profitable business:** This can be accomplished via a job rotation programme that could incorporate partners and customers.
5. **Dismiss the “Not Invented Here” syndrome:** “If we make the best use of internal and external ideas, we will win. We don’t need to own everything ourselves and keep it under tight wraps. We should profit from others’ use of our innovation process, and we should buy others’ intellectual property whenever it advances our own business model.”
6. **A willingness to strive for balance between internal and external R&D:** “External R&D can create significant value; internal R&D is needed to claim some portion of that value.”
7. **Willingness to be a risk taker rather than being risk averse:** Common sense should be used to balance the risk level.
8. **Accepting that OI does raise intellectual property issues:** “Your legal team can choose to either play offence or defence. Hopefully, they’ll adopt a constructive approach that supports progress toward the company’s business development goals.”
9. **Understanding that OI requires open communication:** “Work around confidentiality and intellectual property issues to create an environment based on trust.”
10. **Not needing to always be first:** “Building a better business model is better than getting to market first.”

Source: Stefan Lindegaard, The Open Innovation Revolution: Essentials, Roadblocks and Leadership Skills, June 2010, Wiley

Cooperation between companies and labs/universities

In order to build their capacity for OI, in addition to internal HR management and training programmes, enterprises can choose to develop their human capital externally through engagement with the tertiary education system.

This offers companies a pre-competitive advantage through privileged access to research results and the possibility of influencing areas of research topics. Surveys (i.e. NCVET in 2012) have proven that companies which foster links with educational institutions, in particular, tended to be more successful in developing innovative capacity than those that don't.

At the same time academia can benefit from additional funding for teaching and research activities, as well as get access to modern research equipment and infrastructure. Interaction with industry brings relevant new market skills to the classroom, enriching students learning experience and providing them with the necessary skills for the job market. As the example of Electrolux Design Lab demonstrates, these forms of student cooperation (as outlined below) can provide career opportunities for students. Several of them are subsequently employed by the companies or invited for internships. Others have gone on to start successful businesses.

FORMS OF COOPERATION

Various forms of cooperation in Human Capital can be observed:

- **Faculty awards or industrial scholarships** can be used to honour, with company support, individual outstanding researchers (Ph.D. students or postdoctoral fellows). By providing financial support, they are meant to encourage them to pursue a research career or facilitate work experience in industry. Some examples are NSERC's Industrial Programmes or the IBM Ph.D. Fellowship Programme. The latter enables faculty members to nominate students interested in solving problems that are of relevance to IBM.
- **Student competitions** enable companies to tap into the creativity of undergraduate and graduate students. For example, Electrolux launched an annual global design competition called Design Lab. It invites industrial design students to present innovative ideas for household appliances of the future. The jury reviews the entries and awards prizes to the finalists.
- **Cooperative education programmes** help stimulate interest of students in a particular sector. They include undergraduate five-year programmes, alternating between school and work. They can also take forms of guaranteed summer internships in companies for qualified students.
- **Mutual exchange programmes** involve faculty visits or appointments at industrial research labs for an extended period of time (one academic term to one year), often

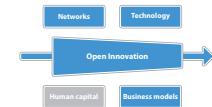
combined with sabbatical leave. In addition, industry grants can help release researchers employed at companies to teach at universities.

- **Industrial research chairs** assist universities in achieving the critical mass required for major research endeavours of interest to industry. They are established directly at the university and are co-funded by industry contributions. The grant usually provides funding for the salary of the chairholder, infrastructure, equipment and general expenses. Chairholders are expected to focus their activities on conducting research and training personnel, while carrying a reduced administrative and teaching load.

KEY CHALLENGES: COOPERATION

- **Scientific Independence** of universities is considered important in providing unbiased educational programmes and research. Researchers are generally thought of as neutral sources without any ideological predispositions when, in reality, they may be backed by an industry that represents a particular standpoint on, for example, debated energy or transport issues. In addition, the relationship with industry may augment the reliance of universities on corporate funding.
- **Protection of IP** is often an obstacle to collaborative engagements between academia and industry. Typically, a separate IP agreement is required for every separate engagement between academia and industry. Perhaps due to these uncertainties, there are no real models for informal exchanges.





COOPERATION PARISTECH AND VINCI CHAIR, FRANCE ECO-DESIGN OF BUILDINGS AND INFRASTRUCTURES

In France, VINCI created a Chair appointment in the eco-design of buildings and infrastructure in association with three ParisTech schools (MINES ParisTech, Ecole des Ponts and AgroParisTech). The company supports this Chair with \$3 million for a period of five years.

The Chair enables the sharing of knowledge between the research community and the practical application of VINCI through publications in scientific and technical journals, sponsorship of research projects by VINCI and organisation of joint events, such as training sessions. By integrating the engineering, master and doctoral studies from three schools, this Chair also contributes to the education of students, developing a nucleus of specialists, on both sides, the ParisTech network and VINCI.



This Chair offers VINCI a pre-competitive advantage through privileged access to knowledge and work of the three ParisTech schools. Its subsidiaries serve as zones of experimentation and propose pilot sites to host researchers and trainees. VINCI's employees also participate in the design of modules for students.

For ParisTech, this is an opportunity to jointly develop research and higher education in the area of eco-design and increase the influence of ParisTech, especially internationally (through invitation of foreign professors, exchange of students and international conferences).

Source: ACE research 2012

RECOMMENDATIONS: COOPERATION

- **Align HR management practices:** To better focus on innovation and forge links outside the company, particularly with education institutions, financial resources need to be put in place. Therefore, companies need to clarify which type of cooperation would be in line with their main activities to bring about clear advantages.
- **Change approach of scientific actors:** Universities need to be proactive in altering the philosophy from the “meeting demand” perspective, to the “creating demand” perspective and take an active role in approaching industry representatives. Partnerships with industry can be facilitated through staff working at academic premises.
- **Be proactive:** Organising “breakfast meetings” and inviting cooperation with academics that have an interest in industry problems gives impetus to interact between researchers and practitioners, to set the stage for further collaboration.
- **Involve students at early stage:** Universities should encourage, support and advise students on how to pursue a research career within industry. Appropriate training programmes for graduates and early stage researchers should be created and adapted.

Effective HR mobility policy

In the context of OI, where the ability to transfer knowledge and experience from one environment to another is key, the mobility of scientific staff is a win-win situation. In particular, the inter-sectoral mobility can help boost skills exchange between the public and private sectors.

For companies, the challenge is to develop diversity and variety in mindsets by introducing different profiles into the R&D teams. The mobility of personnel coming from R&D organisations allows firms to gain access to potentially valuable and complementary knowledge. On the other hand, professional managers and experienced staff from industry can also be recruited for teaching or R&D activities.

Diversity triggers innovation

Several findings confirm that scientific knowledge, which public researchers provide, has a positive influence on the firms' innovation processes; and in combination with their own knowledge, this often creates new opportunities for product development. For example, a recent study of Danish firms confirms that university researchers joining a private sector firm have the largest impact on new employer's patent counts (Ejsing, Kaiser, Kongsted 2011).

The researchers' scientific and technical human capital can also be improved through labour mobility. For the more "entrepreneurial academics", there is an interesting option of spinning out companies from their research bodies. The mobility of the university researchers towards the private sector may provide them with skills to run research projects or laboratories. It enhances their capacity to collaborate with private sector institutions as they get to know the private sector working habits and its focus on commercialisation of applied research, as well as expand their professional networks.

KEY CHALLENGES: HR MOBILITY

- **Recruitment strategies:** Companies often recruit their R&D staff from within the same industry. In addition, there is little opportunity to switch jobs between the science and the corporate world. This result inevitably increases the risk of having sedentary R&D teams.
- **Framework conditions:** Obstacles include difficulties in the transfer of pensions and social security rights, the loss of acquired benefits and professional status, differences in wages impeding the mobility of the private sector employees towards public research, as well as legal and administrative aspects (such as IPR).

- **Shift in mindsets and culture:** In general, public centre researchers produce knowledge under an open regime, which facilitates the interchange and diffusion of findings. The structure of incentives (i.e. peer evaluation, academic recognition) stimulates the rapid spread of findings. In contrast, carrying out R&D activities in firms is in response to economic incentives and the benefits depend upon the knowledge not being accessible to third parties.
- **Skills development:** In order to better meet employers' needs, appropriate training programmes for graduates and early stage researchers should be created and adapted, providing them with the appropriate skills for their eventual future profession in the private business sector.

TRAINING PROGRAMMES, THE NETHERLANDS RESATO HIGH PRESSURE TECHNOLOGY

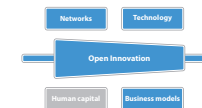
Resato International B.V. is one of the leading manufacturers in the field of high-pressure technology, developing high-pressure components and systems up to 14,000 bar. As a result of more than 20 years of experience, Resato has grown to become an intelligence centre for the development, production and application of high-pressure systems. This forms an open source of information that is always at the disposal of their customers. Resato is an SME that employs around 50 people.



Resato has to deal with a growing shortage of highly educated technicians in general, and the fact that their technology is a niche market, means that there is not a large amount of students available focusing on high-pressure technology in the Netherlands. The company also requires business orientated researchers who are able to develop products in close cooperation with their customers.

To overcome these challenges Resato invests a lot in people through education and investments in an externally orientated culture. It is working on setting up a Resato High Pressure Technology University to effectively obtain, infuse and share the knowledge of this technology with internal and external stakeholders. Through this approach Resato enhances the relationships with external stakeholders, whilst simultaneously developing as an interesting company to work for, attracting early stage researchers and technicians.

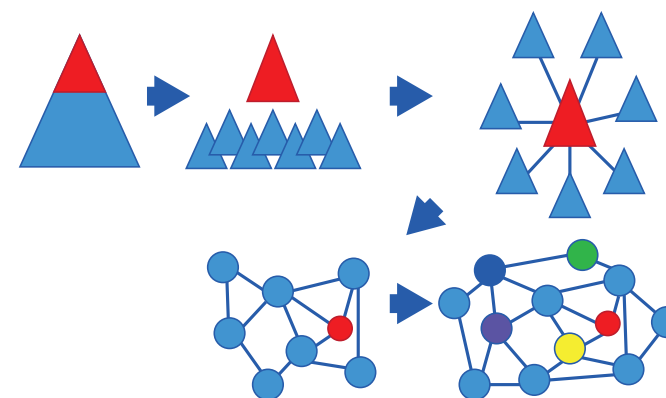
Source: Interview with Rob Castien, CEO of Resato High Pressure Technology



Collaborative leadership

From hierarchy to network leadership

OI means working beyond the boundaries of your own organisation. Moreover, we have noticed that the OI practice is becoming increasingly international. Organisations are moving away from hierarchical, internally orientated models to externally orientated (international) networks of (leading) professionals. This development is visualised in the diagram below:



Source: A. Roobeek, *Netwerklanschap (the network scene, 2005)*

The diagram above shows a passage from one form to the other always takes place in stages. In the nineties, the idea was that a leader should focus on process instead of being involved in content matters. The ideas on management and leadership subsequently developed to a focus on self-managed teams, also referred to as self-directed team or self-managed natural work team. The role of a leader is to facilitate these teams and to empower team members. Team members take responsibility for their own process, as well as the content of their work.

Since the beginning of this century, organisations increasingly collaborate in networks. Managing goes beyond the borders of the organisation, and there is not always a direct hierarchical relation between the people working in networks. The role of a leader today is to connect, facilitate and legitimise the collaboration of people, as well as empower them. It is possible to continue the practice of self-managed teams in a network context. Professionals take responsibility for both content and process. We would like to call this new generation of leaders “leading professionals.” Content knowledge will be more important because the connections develop around the content transferred. Although it is not necessary for the leading professional to also be an expert, he or

➤ RECOMMENDATIONS: HR MOBILITY

- It is necessary to create more bridges between the R&D function and the external partners of the company. It’s particularly necessary to define the skills that the company wishes to recruit and develop internally, and those that can be found externally.
HR policies should:
 - **Develop inter-sector mobility opportunities** via staff exchanges, part-time positions, sabbaticals, honorary positions, or through financial/statutory incentives, offered to both early stage and established researchers.
 - **Integrate crowdsourcing platforms for human capital** such as Yourencore, which connects about 800 retired scientists and engineers with client businesses.
 - **Use the concept of consultancy by academic staff** as a relatively simple way to interact with academia and tap into research expertise.
- Academia and research institutes can explore various ways to facilitate mobility of researchers, such as:
 - **Develop graduate and doctoral programmes in partnership** with the business community to better suit future employers’ needs. Industry involvement in defining and reviewing academic training programmes will also help them to adapt to constantly changing market needs.
 - **Organise placements and internships in industry:** The aim should be to include them in researchers’ curriculums as the case in most engineering and business schools. A minimum period of six months should be ensured.
 - **Employ staff specialised in industrial relations:** Partnerships with industry can be facilitated through assigned staff working in academic premises, such as liaison officers.
- Two-way or one-way secondments of research staff between the public and private sectors are facilitated by a number of **national and EU-funded programmes**, such as the Industry-Academia Pathways. Both, researchers and managers, should exploit the opportunities offered by them.

she has to be able to connect expertise, and therefore understand what it is to be a credible communicator. These experts must be able to connect people and expertise beyond the borders of their organisation. It's also vital to be able to see if a problem has already been solved somewhere else in the world, or if you can solve it faster with others, than on your own.

COLLABORATIVE LEADERSHIP, THE NETHERLANDS LATEXFALT

Latexfalt, a Dutch company that provides products and systems on the basis of bitumen and polymers wanted to make a transition from a reactive, undifferentiated raw material pusher to an innovative, expert full-service provider, demanding a different network orientation, an open mind and a different position in the supply chain. To achieve this position, the company had to change the behaviour of managers, as well as the culture throughout the organisation. They needed more external orientation, more and better collaboration inside and outside the organisation, and a more proactive attitude.



The impact for the customer was a significant culture change towards a more proactive and network-orientated attitude of the management. As a result, both their internal and external performance improved. However, everyone also realised that the road to ultimate success would be a long one. Therefore, several subsequent actions to further develop the networking and leadership skills of the employees and to further improve internal and external processes were defined during the above-mentioned meetings.

ACE involvement: ACE Holland partner, Rijnconsult, led this transition, which changed the orientation and culture throughout the organisation. The top leaders of the organisation went through a programme of six two-day sessions on open innovation, network orientation, network leadership, empowerment and internal and external cooperation.

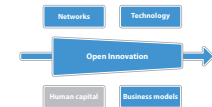
KEY CHALLENGES: COLLABORATIVE LEADERSHIP

- **Business leadership:** Quantifying and clarifying the business case for the network – i.e. what added value will it provide them and their fellow network members.
- **Contractual management:** Managing any contractual arrangements made between network members – some members will not necessarily share knowledge for free, and so there may be a series of contracts or framework agreements they are working within.
- **Inter-relational Leadership:** This means:
 - Being visionary in what the network might accomplish

- Energizing the network
- Acting with integrity/delivering on their promises to gain and foster trust
- Cross-cultural sensitivity
- Proactively managing the key stakeholders within the network
- Influencing skills

- **Recruit leading professionals** with the characteristics mentioned earlier. At the moment, a lot of organisations struggle with the traditional split between more research-orientated people and more business-orientated people. The leading professional combines the two, but the focus on education and training lags behind.
- **Human due diligence:** One way of increasing the likelihood of getting funding is to help the Venture Capitalist (VC) understand the human capability of the respective innovation partners. This can be achieved by undertaking Human Due Diligence.





Alongside legal and financial due diligence, the more enlightened VCs also request an assessment of the individual and collective effectiveness of the management teams in which they might be investing, that measures their potential capability for delivering the business case, and identifies any human-risk factors that might arise. For OI, a Human Due Diligence service would assess not only the capability of the senior managers in delivering their part of the plan, but also the potential for success in the respective partners working effectively together.

➤ RECOMMENDATIONS: COLLABORATIVE LEADERSHIP

- **Keep an open mind** as OI practices may be beneficial also in areas other than technology intelligence and sourcing.
- **Create networks** to get in touch directly with your consumers and all other relevant parties as their needs are changing faster and faster and are getting even more complicated to forecast. In fact, the smarter organisations are network organisations.
- **Expand the application of OI practices** from knowledge creation to process improvement. Firms could, for example, outsource low value-added processes to appropriate external solution providers leveraging adequate networks.
- **Open up the OI networks** developed for internal purposes and their exploitation for profit as Philips did with their High Tech Campus (see page 14).

WIM VANHAVERBEKE “THERE HAS BEEN LITTLE ATTENTION ON THE ROLE OF HUMAN CAPITAL IN RELATION TO OPEN INNOVATION.”



There are a lot of publications on the benefits of OI, about alliances, ecosystems, and to a lesser extent on public policy and R&D projects. But OI is, after all, driven by enthusiastic people and there's very little or nothing about the role of human capital. Yet human capital is a hugely important factor. A lot of projects fail because they lack the right people with the right skills and attitude. But what are the “right skills” and who are the “right people”? That is one of the most difficult strategic challenges for HR departments. Unfortunately, they are not always aware of this fact. It is also important to define and to use the right incentives to stimulate OI and entrepreneurship.

One observation is that companies are too focused on recruiting employees with high potential. But high potential candidates try to avoid the risks involved in setting up new businesses in a large company. They are more comfortable running the existing businesses where there is more certainty to climb the career ladder quickly. In this way, large companies don't get the right people in the new businesses which may drive the future growth of the company.

As companies have to reach to external sources of ideas and technology in an era of OI it is important to look for people that have a high EQ and not only a high IQ. It is therefore extremely important to embrace diversity and hire different people; some should not be afraid of taking risks, others have to be bridge builders, building and maintaining internal and external relations (networks). After all, a company can only thrive nowadays if it nurtures its own innovation ecosystem.

According to Vanhaverbeke some of the important (research) questions right now are:

1. What incentives can stimulate an OI culture?
2. What kind of leadership is needed to stimulate OI?
3. What is the function of the HR department in relation to OI?

It is now vital to recognise the role of managing human capital in relation to OI.

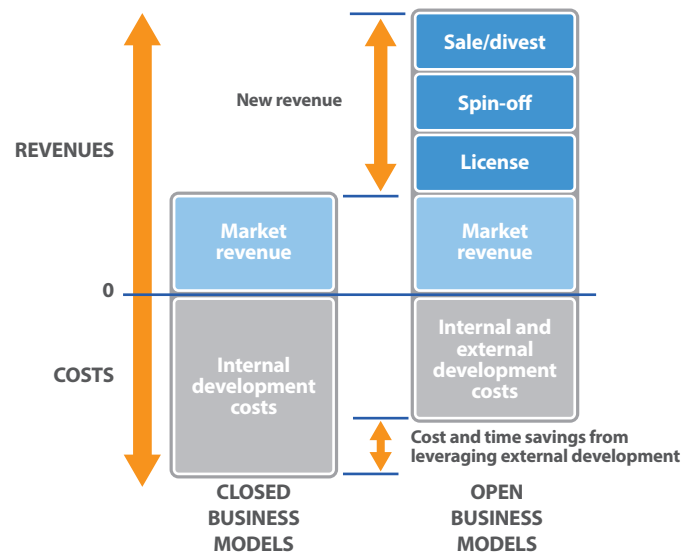
Source: Interview with Wim Vanhaverbeke, editor and co-author of: “Open Innovation: Researching a New Paradigm.” Henry Chesbrough, Wim Vanhaverbeke and Joel West, eds. (2006) Oxford: Oxford University Press.

The four dimensions of Open Innovation: Business models

IP & Appropriability Management

The open business model claims to incur fewer costs whilst increasing revenue through new sources. Figure 9 below shows how companies can ideally save costs and time by leveraging external sources. At the same time, the possibilities of divesting, spinning off and in/out-licensing technologies/products, create additional new sources of revenue, making the open business model attractive.

Figure 9: The ideal open business model cuts development costs and increases revenues



Source: Adapted from Chesbrough (2005)

Managers must understand the role of intellectual property rights (IPR) in OI in order to take advantage of these possible alternative revenue streams.

Sharper contrast between open and secret knowledge

The world, however, is getting more secretive and closed despite the fact that companies are collaborating more than previously seen. In other words, the contrast between what's secret and what's open is sharper than in past decades. This might sound counter-intuitive, but as companies become more aware of protecting their core while staying flexible, the contrast between "open" and "closed" will increase. The challenge for many firms is knowing when to open up and when to

protect their knowledge. And some will obviously be more successful at this than others.

As always, the culture, business environment, competition and IP traditions differ from country to country, market to market and firm to firm. One thing is certain – keeping the right balance between business versus legal issues is vital.

IP in Open Innovation

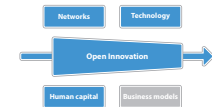
In recent years, IP issues in OI networks have been a popular topic at conferences and within OI communities. Typical problems include:

- Loss of patenting opportunities
- Loss of trademark secrets or confidential information
- Risk of losing design/copyright advantage
- New competitors due to the sharing of information
- Loss of freedom to operate (sharing too much can hinder own actions)
- Outright theft

To preempt and overcome many of these problems, where IPR issues shift the focus away from the innovation process, there are a few things to keep in mind. The following challenges and recommendations highlight what you need to know about IP and appropriability in OI settings.

KEY CHALLENGES: IP & APPROPRIABILITY MANAGEMENT

- Today's fast pace of change inevitably results in smaller windows of opportunity – and therefore less time to profit from successful innovation. This requires innovation departments to be fast and flexible, while at the same time protecting their ideas and assets.
- Legal departments can be resistant to the open approach if they are not properly informed about the principles of OI.
- Like many aspects of business life, companies should naturally pay attention to IPR issues before, during and after the project. The key challenge is to strike the right balance of how much to share and when to share it.



➤ RECOMMENDATIONS: IP & APPROPRIABILITY MANAGEMENT

- **Protect the core while staying flexible on the layers:** A way to do this could be to develop strong platforms for the core of the company whether it's a certain technology, a unique business model, processes or know-how. If companies make sure that these platforms are highly protected, they can safely allow for flexibility, with less protectionism on the outer layers of the products and services being developed. OI networks in each company, therefore, need to be aware of what their core is, and in which areas they can afford to be flexible.
- **Use lawyers with a business mindset:** The business case should take lead over legal issues, not the other way around. Moreover, many discussions have emphasised that less skilled lawyers might focus on reducing risks rather than seeing opportunities in OI. Skilled and business-minded lawyers are therefore key in OI to avoid IP-related problems.
- **Agree on the scope and type of agreement:** When creating OI agreements, companies should cover two things. Firstly, they should define the main business aspects, such as goals, definition of work, obligations, deliverables and project management. Secondly, they should agree on how and when to handle IPR and the outcome of the project, without forgetting clauses, such as force majeure.
- **The level of openness should be adjusted according to the business environment you're in:** There are cultural differences when it comes to the importance of trust versus contracts in OI relationships. For example, Asian and Northern Europeans take pride in their fairly open and trusting approach where very few people see reasons to be suspicious or protect themselves legally. But in countries like the US, the signing of legal contracts to protect IP are fairly normal as they are much more protective when entering OI relationships. In the long run, however, many experts argue that the open-minded approach is the best as innovation is moving from a transactional to a more relationship-based approach.

OI ONLINE PORTALS, GERMANY BOSCH



As a global company with €50 billion turnover and a total of around 300,000 employees, Bosch needs to take advantage of global opportunities for strong and meaningful development on electronics. In order to increase their innovation rate, Bosch created three OI Portals:

- Bosch Purchasing Innovation (purchase of innovative ideas)
- Bosch Power Tools Innovation (suggestions for improvements and ideas for new products)
- Bosch Automotive Aftermarket Innovation (a Portal from professionals for professionals – Bosch repair-shop community)

Whereas the Bosch Purchasing Innovation Portal was created to collect innovative purchasing ideas, the Bosch Power Tools Innovation Portal is used to create new products and suggestions for product improvements alongside customers, freelance engineers, hobby engineers, suppliers and others.

The Automotive Aftermarket Innovation Portal was generated as an idea tank and information exchange – a Portal from professionals for professionals. Therefore it is also called the repair-shop community.

Within the portals, Bosch is looking for new product and process ideas, asking questions like: Do you have a solution for dust avoidance (June 2012)? With the help of Open Innovation Portals, Bosch was able to significantly increase the information exchange, generate new ideas and introduce a new marketing tool.

The user of the portal has the advantage of easily handing in innovative ideas. Every idea – regardless of whether it is an answer to one of the given questions, a suggestion for product improvements or an innovative product idea – is analysed by Bosch's innovation team. They are committed to not use the idea until they officially decide on buying it and a license contract is signed. Until the point of sale, the innovator owns the right of intellectual property.

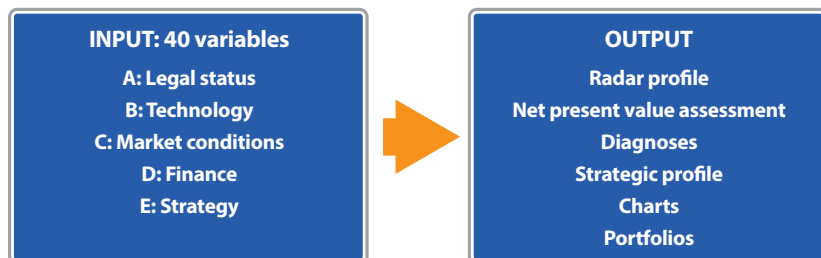
Source: ACE research 2012

PATENT PORTFOLIO MANAGEMENT, EUROPE IPSCORE FROM EPO

IPscore is a tool for evaluation and management of patent portfolio. IPscore2.0 was initially developed in 2001 by the Danish Patent and Trademark Office, in collaboration with Professor Jan Mouritsen, the Copenhagen Business School and a number of Danish companies. The European Patent Office purchased the tool in 2003 and developed a multilingual and improved version, IPscore2.2.

IPscore provides both qualitative and quantitative evaluation of a patent or a technology in the form of a financial forecast showing its net present value. It also produces output in the form of graphical overviews and a report to facilitate communication of the results of the evaluation.

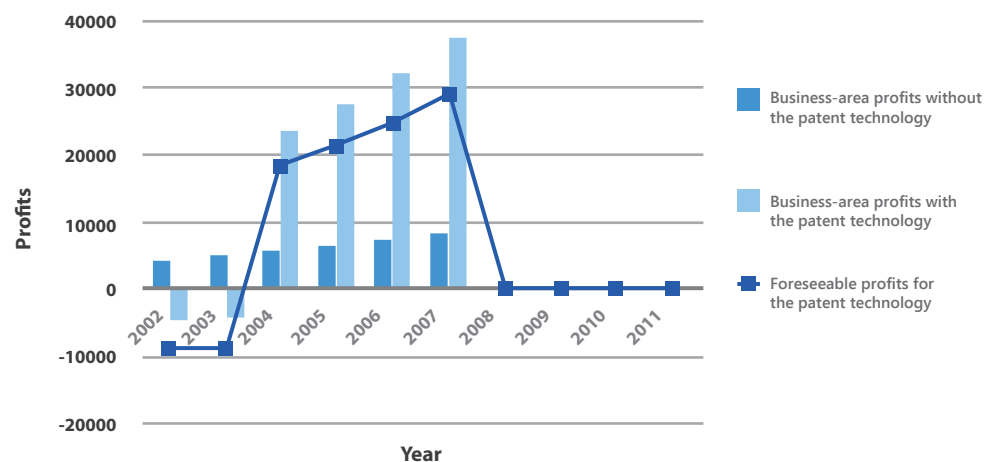
Currently, IPscore is made available to users free of charge in order to support the patent strategy of companies, mainly SMEs (<http://www.epo.org/searching/free/ipscore.html>). However, national patent offices in several countries are prepared to provide support services on the use and the interpretation of output from the tool to end-user.



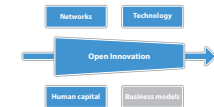
The IPscore assessment of a patent consists of five categories: legal, technology, market, finance and strategy. Each question relates to a different value indicator. In each question, the patent is rated 1-5 according to its strengths and weaknesses. Together, the 40 or so value indicators form a whole picture of the patent and related risks (i.e. existence of an alternative technology) or opportunities (i.e.

winning new markets). These are then displayed in various tables and graphical forms to be used by management for taking strategic decisions regarding strategic patents management. In this way, IPscore can display information relevant to the decision-making process and facilitate cross-functional cooperation within companies.

Financial forecast of business-area development achieved by exploiting patent x1



Source: ACE research 2012



Venture funding

Corporations seeking OI may pursue a variety of “venture funding” activities that go beyond or outside the traditional approaches to R&D and business development. In the context of OI, collaboration between large firms and (often VC-backed) new ventures is important. Venturing is a tool for rapidly prototyping new business models and accessing markets or technologies that would normally be out of reach for many companies.

Venture funding can take different forms in order to support OI, such as defining alliances with venture capitalist funds, setting up corporate venture funds (internal and external), as well as using new forms of venture funding like crowdfunding or social venture funding.

Venture capitalists

Venture capital (VC) is financial capital provided to early-stage, high-potential, high-risk, growth startup companies. The venture capital fund finds its profits by owning equity in the companies it invests in. It usually focuses on companies which have a novel technology or business model in high technology industries (biotechnology, cleantech, IT, software, etc). VCs often play a crucial role in the development of OI, i.e. developing new ways to monetise the largely untapped patent repositories in big companies. They benefit from bringing these technologies to the market. They can also play a role in managing OI as they usually get significant control over company decisions, in addition to a significant portion of the company’s ownership. Defining a strategic alliance with a VC fund can also be the means for a company to raise funds for its spin off or to detect investment opportunities in innovative companies.

The typical stages of venture funding

Seven stages of venture round financing can be identified in VC funding, which correspond roughly to the stages of a company’s development. At these different levels, business angels and venture capitalists can play an important role in the OI process, providing not only money but also competencies and networks to entrepreneurs:

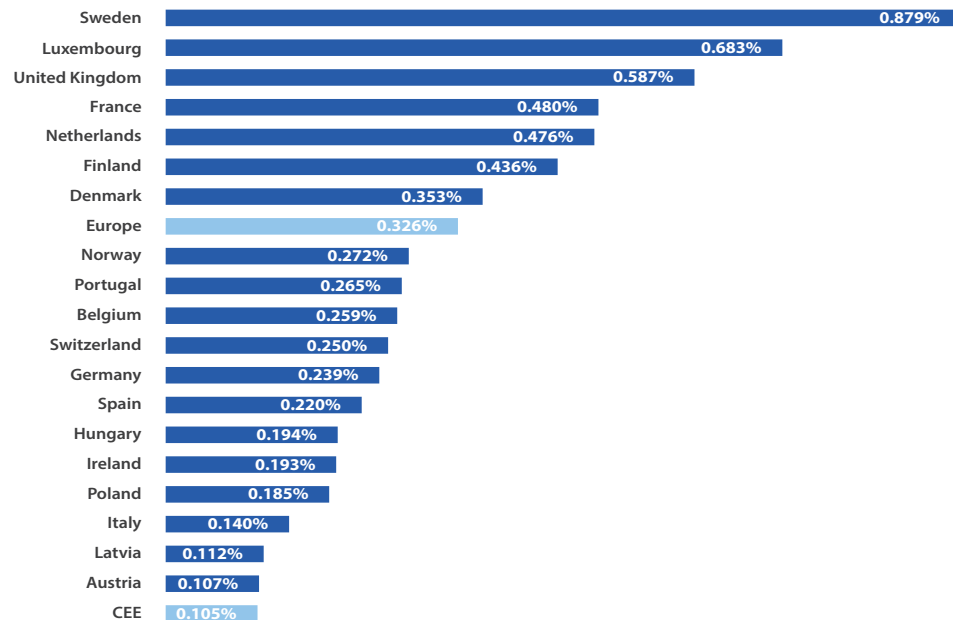
1. **Pre-seed Money:** Initial investment that helps to define the project, sometimes referred to as love money (as it generally comes from family and friends).
2. **Seed Money:** Low level financing needed to prove a new idea, often provided by angel investors. Crowd funding is also emerging as an option for seed funding.
3. **Early stage:** Funding supporting start up for expenses associated with marketing and product development.
4. **Growth funding round (or Series A round):** Early sales and manufacturing funds.

5. **Second-Round:** Working capital for early stage companies that are selling a product/ service, but not yet turning a profit.
6. **Expansion:** Also known as Mezzanine financing, this is expansion money for a newly profitable company.
7. **Exit of venture capitalist:** Also called bridge financing/4th round to finance the “going public” process.

(Adapted from Ross, Westerfield, Jaffe)

The typical VC investment occurs after the seed funding round or growth funding round (also referred to as Series A round) in the interest of generating a return through an eventual realisation event, such as an IPO or trade sale of the company.

Figure 10: Private equity investments as percentage of GDP for Europe, CEE and selected European countries, 2011



Source: EVCA/PEREP_Analytics for investment data and Thomson Reuters for GDP data.

What role does corporate venturing play in OI?

Corporate venturing is used to source-in or source-out technologies through the creation, acquisition or spinning out new ventures. Some large firms have taken the OI model further by forming alliances with startups or even acquiring them. The more progressive firms have formed their own internal venture groups to power their own innovation process.

Internal venturing programmes **give entrepreneurial employees resources and opportunities to create new ventures** (i.e. seed funding for R&D or incubation resources to create new businesses). The venture process brings the technologies to market quicker. Successful internal ventures may eventually be incorporated into an existing business of the corporation, set up as a new business unit, or spun out as an independent company (**corporate spin-off**). In the latter case, operating an internal new ventures group enables the firm the monetisation of technologies that are not completely in line with the core competencies and strategy of the mother company, and go unused in the firm's own business.

External corporate VC programmes aim to **identify and access external sources of entrepreneurial innovation**. At its most basic, it can be a purely financial investment with a larger company taking an **equity stake** in a smaller company. This is often done through a separate fund being set up specifically to invest in startup and growth companies in the same way that a traditional venture capital firm would.

Corporate venturing and OI

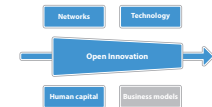
Corporate venture capital (CVC) may be defined as programmes in established firms that make investments in entrepreneurial companies. A CVC fund makes a financial investment – as would an independent venture capital firm – and it receives a minority equity stake in the entrepreneurial company. A CVC may also facilitate investment of in-kind and other resources into the portfolio company. In return, the corporation gains a window on both new technologies and strategically complementary companies that may become strategic partners (source: NIST). While independent venture capital mainly focus **on financial return**, CVCs generally have **strategic objectives as well**. These objectives include leveraging external sources of innovation, bringing new ideas and technologies into the company, or taking “real options” on technologies and business models by investing in a wider array of technologies or business directions than the company can pursue itself.

CVCs interest is that it helps to identify technologies and opportunities that fall between or beyond the corporation's. Corporate venturing is used **to source-in or source-out technologies** through the creation, acquisition or spinning out new ventures. The outside-in and inside-out processes we described before are also relevant for CVC. Corporate venture capital includes both internal and external venturing. Internal venturing programmes “go inside” the firm and

create entrepreneurial ventures from within the corporation. Entrepreneurial teams are granted independence and resources to innovate and form new business ventures. External venturing programmes “go outside” the firm and tap into external sources of innovation, whether through strategic alliances with other firms, or partnerships with entrepreneurial companies. Often the firm's internal and external venturing efforts are closely related and interact with each other. In both cases specific challenges apply.

👉 KEY CHALLENGES: VENTURE FUNDING

- **Internal venturing programmes** give entrepreneurial employees resources and opportunities to create new ventures (i.e. seed funding for R&D or incubation resources to create new businesses). The venture process brings the technologies to market quicker. Successful internal ventures may eventually be incorporated into an existing business of the corporation, set up as a new business unit, or spun out as an independent company (**corporate spin-off**). In the latter case, operating an internal new ventures group enables the firm the monetisation of technologies that are not completely in line with the core competencies and strategy of the mother company, and go unused in the firm's own business.
- **External corporate VC programmes** aim to identify and access external sources of entrepreneurial innovation. This is another, more “capitalistic” way of pooling resources. They often enable companies to develop on markets or technologies, which are adjacent and complementary to their product portfolio. Depending on the scope of these transactions, they may involve all sizes of industrial-type projects.



FUNDRAISING, ITALY PERINNOVARE

The Northeast is one of the Italian regions with the highest concentration of SMEs. For these firms, successfully going through the innovation process most of the time is a really tough challenge. Since lack of brilliant ideas is definitely not a problem, why is it so difficult to innovate for them? Lack of financial means, inability to attract investors and to orchestrate talent are the real reasons which stop the innovation process. Since entrepreneurs needed a trustable platform to overcome these obstacles, PerInnovare – a services firm held by Confindustria Verona (representing manufacturing and service companies in the Verona province) was founded in 2007.



PerInnovare has achieved its mission by raising capital on behalf of SMEs, and by strengthening links among universities, scientific labs and enterprises.

Not only has PerInnovare helped more than 40 SMEs to raise funds (€15 million in three years), but it has also favoured the creation of local consortia, it has developed business plans for start-ups and, in the biotechnology and telecommunication industry, it has found practical application to unexploited pending patents.

PerInnovare brokerage services generate €200 million-plus per year.

ACE Involvement: ACE Italy, GEA, co-founded and launched PerInnovare as a lean company with the scope to act as a catalyst between demand and offer for innovation; GEA designed the business model and its related services.

➤ RECOMMENDATIONS: VENTURE FUNDING

In order to realise its projects, a company needs to access many external resources. When negotiating with VCs or creating a CVC fund, one needs to consider the following dimensions:

- The vision/ambition of the VC for the company (i.e. going public) and the management style.
- Venture funds that have a specialisation in the industry, and will help to share decisions and find new partners.
- The focus of VC in terms of business situation: some VCs tend to invest in new ideas, or fledgling companies; others prefer investing in established companies that need support to go public or grow.
- The perimeter of intervention: some VCs prefer operating locally (in a cluster), while others will operate nationwide or even globally.

To benefit from OI, investors running VC or CVC funds should consider:

- To make small investments in multiple options on technology, especially in business involving a high level of uncertainty (learning investments).
- To syndicate the investment in order to benefit from other people's money, exploring the different options such as: equity alliances, joint ventures, etc.
- To invest step by step and to conduct a significant financial and market analysis before following on or aborting the project.
- To spend efforts on studying all options to value the investment if the project at some point does not fit any more with the strategy (licences, selling technologies, etc.).

CROWD FUNDING

Crowd funding is emerging as an alternative to traditional venture capital. Crowd funding is an approach to raise the capital required for a new project or enterprise by appealing to large numbers of ordinary people for small donations. While such an approach has long precedents in the sphere of charity, it is receiving renewed attention from entrepreneurs such as independent film makers, now that social media and online communities make it possible to reach out to a group of potentially interested supporters at very low cost.

Some crowd funding models are also being applied for startup funding, for example, Grow VC. One of the reasons to look for alternatives to venture capital is their large focus on later-stage investments. Crowdfunding, like Crowdsourcing, is very much related to online communities and social networks. One of the limits of posting new ideas on crowd funding sites is that there may be little or no IP protection provided by the sites themselves.



SPACEHIVE NEW FUNDING SOURCES FOR COMMUNITY PROJECTS

Spacehive is a London-based online funding platform that helps people raise money for local social projects in their community. Neighbourhood improvement ideas like new green spaces, rejuvenated sports facilities, a playground for children can be posted on the site and anyone can pledge funding to them, helping them to become a reality.

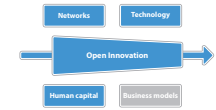


A team of coordinators from Spacehive assists communities in developing their projects. Currently, six projects undergo the concept and design phase, such as the free Wi-Fi project in the shopping zone of Mansfield or the transformation scheme for London's disused railway viaduct. In addition, Spacehive helps raise funds for the long unused dock area in London to turn it into a bustling creative quarter. The Glyncloch Community Centre is an example of already completed fundraising action for the construction of an energy-efficient community hall in a small village in Wales.

The community turned to Spacehive with the objective of raising the remaining 6% of financial resources necessary to get over the finishing line before the public grants expired. In the end, a total of £792,021 was secured and the building featuring a conference suite, an IT centre and facilities for young people was opened for use in 2012.

In the context of impending cuts on the local budgets, Spacehive helps communities realise popular projects independently or in supplement to public support. However, what makes Spacehive powerful is that it not only helps projects get funded, but it also gives people a platform to imagine how they'd like to see their surroundings, then see if the community supports it, or has suggestions to improve it. In this way "Spacehive helps communities transform their local public spaces."

Source: ACE research 2012

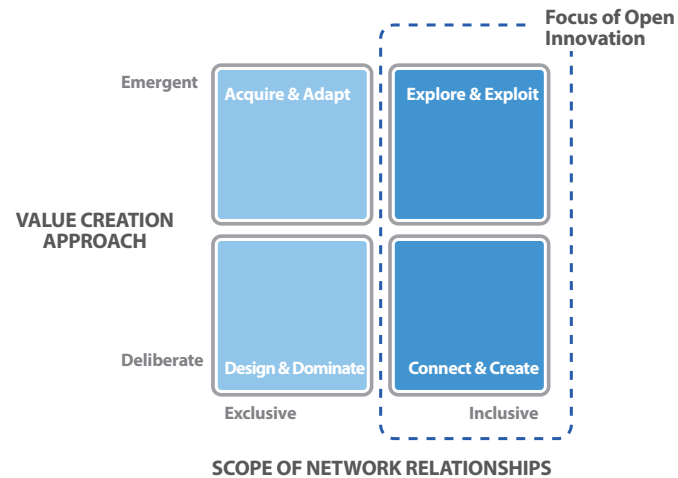


Open Business Models

Innovation is often expensive. But consider how expensive it would be to stop innovating. The key is to make innovation more effective in cost, time, and risk management by extending it to business models. The changes required to make OI happen go well beyond the company's innovation process to its business model.

Put simply, a business model serves two functions: it creates value, and it captures a portion of that value. In other words, the role of the business model is to transform technology and know-how into value, which profits the company. A business model is executed to realise the strategy of the company and should therefore be built around the company's strategy. From this perspective, business model innovation is the central tenet of OI.

Figure 10: Business models in the context of OI



Source: Adapted from Venkatraman & Henderson, 2008. Dotted line added.

The framework proposed above identifies what triggers business model innovation in the context of OI. The right part of the model shows the two inclusive, i.e. open, ways of innovating which characterises OI. The more deliberate way is to connect around a certain issue, challenge or technology and create something through collaboration. The other more exploratory and proactive approach is to go beyond the company's current horizon to explore new emergent issues, challenges or technologies to work around.

From a business perspective, opening up the business model can either cut costs or increase revenues – or ideally both. For cost and time savings, this helps the company utilise external knowledge – not

just concentrate on internal knowledge held by the firm. To gain new revenue streams, the business model can be adapted to find external opportunities from the patents held by the company.

To link it all together, researchers claim a link between certain types of business models, the innovation process and the role of IP management as an asset to the company. The links are explained in the table below and show, for example, how:

- Type 2 companies with differentiated business models usually have a more unplanned ad-hoc-based innovation process where IP concerns and IP management is carried in a more responsive manner.
- On the other hand, Type 6 companies have flexible and adaptive business models where innovation efforts include the exploration and consideration of new business models. Therefore, IP and appropriability management becomes a more proactive and strategic asset.

	Business model	Innovation process	IP management
Type 1	Undifferentiated	None	Not applicable
Type 2	Differentiated	Ad hoc	Reactive
Type 3	Segmented	Planned	Defensive
Type 4	Externally aware	Externally supportive	Enabling asset
Type 5	Integrated	Connected to business model	Financial asset
Type 6	Adaptive	Identifies new business model	Strategic asset

Source: Henry Chesbrough 2006

It is important to remember that the business model is an important part of OI. In fact doing OI implies innovating your business model in the first place, so OI naturally involves business model innovation.

➤ KEY CHALLENGES: OPEN BUSINESS MODELS

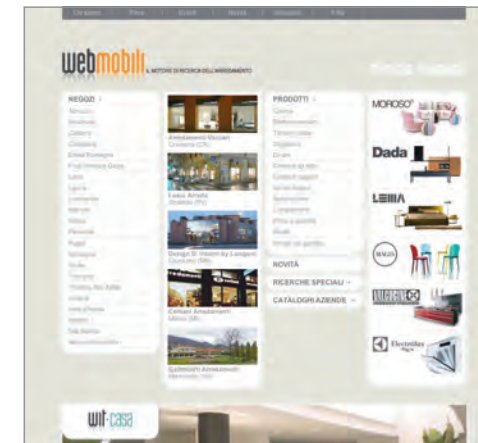
- Open business model implies a new approach to IP management: companies have to pass defensive reactions to consider IP as a strategic asset in order to interact with their environment.
- It can take time to find the right open business model that leverages the company's core competencies but also builds upon and expands the company's network. External growth can help to accelerate the evolution of the business model but it can have strong consequences for the organisation of a company.
- Companies sometimes forget to ensure a link between its OI business model and the company's overall strategy. Open business models should help to focus more effectively on the company's strategic goals in terms of market targets, news technologies acquisitions, incomes, cost savings, etc.

➤ RECOMMENDATIONS: OPEN BUSINESS MODELS

- Based on the above figure, if a company is seizing new opportunities within emerging markets or technologies, the company is better off using a more exploratory business model. However, if the company wants to take advantage of specific market trends or strategic openings in the market, the company should consider the "connect & create" approach.
- It is in fact difficult to determine rules on how to define the appropriate open business models. Every company should define its own model according to its market, competencies and strategy. Companies should consider learning from the experience of others and seek expert advice to help them accordingly.

OPEN BUSINESS MODEL, ITALY WEBMOBILI.IT

With a turnover of more than €40 billion, the furniture industry is extremely relevant in Italy and shows distinctive features. Fragmentation of production and distribution is definitely one; producers most of the time are medium-size firms settled in regional districts, and re-sellers are independent shops and usually do not have exclusive distribution contracts with producers. Moreover, brand and distinctive design are critical in this field: before buying a piece of furniture, the consumer often already knows the style and the brand that he/she is looking for. However, considering the structure of the distribution channel, he/she might find difficult to find a re-seller licensing it.



In this context, Webmobili has proved to be a simple, yet successful open business model. It is, in fact, a web-based portal that looks both at re-sellers and at consumers. Webmobili gathers product catalogues from the main producers, harmonizes and classifies their offer alongside a wide set of variables, such as type of furniture, style, price, brand, etc. The re-seller willing to acquire visibility on the web towards targeted consumers can pay a fee to become part of the Webmobili portal to sell their brands and the type of furniture they license. This way, consumers looking for a specific brand or piece of furniture, can easily go through Webmobili.it, set a combination of research parameters such as type of furniture, geographical area, price range, brand and easily find the contact details for the shop re-selling the products they like.

Webmobili is the Italian leader in its segment and promoted by Federmobili, the organisation that represents the Italian furniture re-sellers.

Source: ACE research 2012



Conclusion & Recommendations

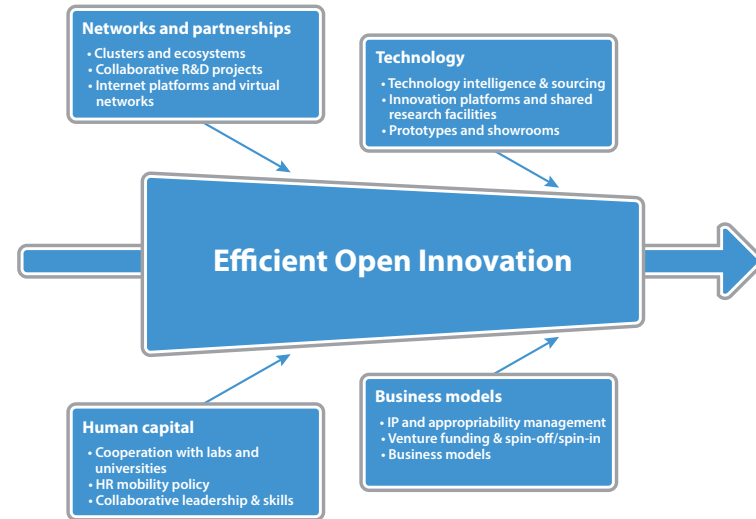
Ever growing and fiercer competition, increasingly demanding and connected (global) customers and markets, combined with rapid technological progress and growing mobility of skilled workers put high pressure on organisations, no matter whether they are public or private. They need to cut costs yet serve their customers faster and better – an apparent contradiction in terms.

Over the past decade the approach of OI, embedded in the digital world and its related hyper-connectivity and continuous communication, has continued its successful entry not only into large multinationals, but also SMEs and public organisations. The idea behind it is simple: organisations should make greater use of external ideas and technologies whilst leveraging their (unused) in-house R&D ideas/technologies outside their operations.

1 THE BENEFITS OF OI ARE SIGNIFICANT:

- **Cost efficiency:** By leveraging other innovators' ideas, organisations may significantly reduce costs since they only pay for the specific part/idea they are using; furthermore, an organisation can focus on its specific bottleneck hence generate significant time savings which then translates into quicker time-to-market.
- **Share risks and rewards:** Together with cost-efficiency, organisations incur fewer risks when collaborating with the outside in their quest for new ideas/technologies. They also increase their success rate of products/services.
- **Networks creation and branding:** By sharing an organisation's wealth of ideas and technologies along its value chain, an organisation may attract and stimulate members (customers, suppliers and business partners) of its own ecosystem. It may eventually position and brand itself in a more coherent and trustworthy way than through classical and expensive advertising campaigns.
- **Royalty income:** By offering ideas and technologies to the outside, an organisation may generate additional income through licensing agreements, selling patents, spin-offs, etc.

2 **CONSIDER ALL FOUR DIMENSION:** There is no shortcut – opening up an organisation's innovation requires a good understanding of the different dimensions influencing the success of OI and how to tackle practical challenges.



3 **READINESS OF AN ORGANISATION TO EMBRACE OI:** Hard and soft factors equally influence the success of OI hence organisations need to be well prepared before embarking on their OI journey:

- Make the right choice with respect to topic, project and platform before applying OI in a comprehensive manner:

For example: The definition and description of a specific technical bottleneck that customers, sales people and/or R&D have complained about; preparation of specific questions to be answered; the right choice of OI tools (e.g. real versus virtual networks).

- Clear communication of goals and definition of relevant targets to achieve them:

For example: An organisation's goal is to launch a new product/service with enhanced USP (unique selling point) within the next two years. Its targets to achieve this goal can equally promote internal and external new ideas; force the internal R&D that new, internal ideas will be offered to the outside if not used internally within a certain amount of time (commercialise these 'false negatives': ideas that initially and internally seem unworthy to pursue but effectively have potential commercial value).

- Embrace transition and change in the mindset as a whole organisation/R&D department together with top management:

For example: OI implies a new approach of management in which trust replaces strict authority. OI spirit is not only a question of competencies; it requires modesty to accept risks, to overlook failures and take on external solutions. A specific state of mind is required to make the best of potential internal and external contributions.

4 SUCCESSFUL IMPLEMENTATION OF OI: As mentioned earlier, there are different dimensions to OI, hence also differences to be aware of when implementing it. But we found there are a few common issues to keep in mind, regardless of which specific area you are focusing on.

- Trust and authenticity is the glue between all partners; it's about give and take, which requires time, patience and goodwill:

For example: External facilitators not representing one party's view can especially help to establish trust and interaction among partners when starting a network or cluster. In this context, it is crucial to choose the right experts or consultants together, and share the costs of their assignments together.

- Choosing the right cooperation partners will provide the necessary know-how and expertise. Agree division of responsibilities and tasks between partners:

For example: It is easier to start a collaborative project based on a consortium gathering the different bricks of the value chain. Collaborations between SMEs and large corporations are also a relevant way to find synergies and to avoid potential conflicts in markets. As some of our examples demonstrate, agreements between direct competitors are also possible, but they usually require several years to build trust and to define the right cooperation agreement.

- Careful balancing between different goals is a must:

For example: Whereas scientific organisations have a major interest in fast publication of the acquired knowledge in peer-reviewed journals, enterprises need time and confidentiality to implement the results into marketable products or business models. Public and private partners should therefore agree with each other schedules and ambitions in terms of publications and product promotions.

- IP concerns need to be addressed and solved to the satisfaction of all parties:

For example: IP agreements have to be defined by all partners at the very beginning of any collaboration. As time is goes on, business issues lead to growing pressure on partners, making IP discussions more nervous. IP agreements should be the starting point to create an environment of trust.

- Talent management and overall human capital impact:

For example: The value of an OI manager does not rely on its capacity to simply accumulate ideas, technologies and patents within the company. The OI manager is more of a network manager, whose value depends on his/her ability to detect quickly and to evaluate the best options available. He/she also must be able to integrate at the right time with relevant conditions, the proper solutions to the company challenges.

5 FUTURE OF OI: We believe organisations will continue to open up their innovation – not only thanks to their strong belief in its benefits, but also because they have no choice if they want to remain competitive. Being in touch with one's ecosystem is crucial to understand the expectations, needs and limitations of customers, partners and suppliers. Time/pace will continue to be an important differentiator.

Most organisations deploying an OI strategy today appear to be more focused on the outside-in approach. This might be because it seems easier to receive and manage external know-how than giving its own know-how out. Still, this is likely to change due to the additional turnover in commercialising unused ideas, hence generating profit beyond an organisation's traditional business.

OI has great perspectives as it offers unlimited opportunities to provide customers with more innovative products and services. Open culture, open testing, open business models, open innovation, etc. have no limits as long as it leads to market needs.

The public sector is slightly lagging behind in opening up and embracing OI as a way to improve their services. Our own experience with public organisations and their increasing interest in OI strategies confirm the potential we see for this sector and the consequent improvement of their performance.

We have prepared a short self-assessment for you to check your own readiness to apply OI principles – page 50. It will only take you a minute to see where your organisation stands with respect to OI, and which aspects you have incorporated better than others.

If you would like to discuss your results further, please feel free to get in touch with any of our local ACE partners.

Glossary

- **Appropriability:** the innovator's ability to capture profits generated by an innovation.
- **Clusters:** a geographic concentration of interconnected businesses, suppliers, and associated institutions in a particular field.
- **Collaborative leadership:** comes from an emerging body of theory and management practice which is focused on the leadership skills and attributes needed to deliver results across organisational boundaries. A collaborative leader is one who has accepted responsibility for building – or helping to ensure the success of – a heterogeneous team to accomplish a shared purpose.
- **Collaborative R&D projects:** brings together science and industry to promote, facilitate and accelerate technological innovation efforts. They involve an interdependent exchange process between organisations, such as private firms, universities, private or public research laboratories, suppliers, competitors and customers, from the same/different countries.
- **Crowdsourcing:** an act of a company or institution taking a function once performed by employees and outsourcing it to an unknown (and generally large) network of contributors called “the crowd” (Howe 2006). The crowd's role is principally to submit, and in some cases, to value solutions.
- **Crowdfunding:** an approach to raise the capital required for a new project or enterprise by appealing to large numbers of ordinary people for small donations.
- **Ecosystem:** an innovation ecosystem is a permanent or temporary system of interaction and exchange among an ecology of various actors that enables the cross-pollination of ideas and facilitates innovation. Based on a biological metaphor, it refers to dynamic multichannel networks of researchers, funders, entrepreneurs, legislators, experts and attention workers, where the dynamic process of innovation creation and experimentation takes place.
- **FP7** – 7th Framework Programme for Research of the European Union which finances collaborative R&D projects in various fields such as ICT, health, transport, energy, etc.
- **Industrial research chairs:** programmes established directly at the university and co-funded by industry contributions. They assist universities in achieving the critical mass required for major research endeavours of interest to industry.
- **Innovation platforms:** provide open access to shared resources, such as research infrastructure, training resources, dedicated real estate facilities, specialised support services, as well as a community of users.
- **Living Lab:** is a user-centred, open-innovation ecosystem, often operating in a territorial context (e.g. city, agglomeration, region), integrating concurrent research and innovation processes within a public-private-people partnership in different fields such as mobility, energy, ambient assisted living, etc.
- **Networks:** collaborative structures that create new patterns of cooperation with a common purpose. They rely on trust and reciprocity for the exchange of knowledge and establish processes, information flows, and relationships required to create synergies between members.
- **Open business model:** an open business model uses a new division of innovation labour, both in the creation of value and in the capture of a portion of that value. Open models create value by leveraging many more ideas, due to their inclusion of a variety of external concepts (Chesbrough 2006).
- **Open prototypes:** prototypes that involve the user in a direct way. These prototypes are handed over to potential customers/users in order to observe them through the process of using and experiencing the prototype.
- **Prototype:** an early sample or model built to test a concept, product or process or to act as a thing to be replicated or learned from. Prototypes are usually built for demonstration purposes or as part of the development process to test the feasibility of products before their introduction into the market.
- **Technology intelligence:** an activity that enables companies to identify the technological opportunities and threats that could affect the future growth and survival of their business.
- **Technology sourcing and procurement:** activities that enable to identify external technologies or equipment that fit with business objectives and are thus candidates for purchase, potential licensing or intellectual property acquisition.
- **Technology transfer:** a process of transferring skills, knowledge, technologies from one organisation to another to ensure that scientific and technological developments are accessible to a wider range of users who can then further exploit it.
- **Triple Helix:** partnerships between science, enterprises and public sector organisations. They can, for instance, be used to strengthen the economic performance of a region, or to open up the (public) knowledge infrastructure.
- **Tryvertising:** a lab-type environment where potential customers can try the products before they actually buy them.
- **User-driven innovation:** refers to innovation by intermediate users (e.g. user firms) or consumers (individual end-users or user communities).
- **Venture Capital (VC):** financial capital provided to early-stage, high-potential, high-risk, growth startup companies.

ACE Open Innovation case studies overview

	CASE STUDY	RELEVANT DIMENSION OF OI	RELEVANT STAGE OF THE INNOVATION PROCESS: IDEA GENERATION → RESEARCH → DEVELOPMENT → COMMERCIALISATION/IMPLEMENTATION	WHERE TO FIND IN THE GUIDE
		NETWORKS		
1.	HIGH TECH CAMPUS EINDHOVEN PHILIPS	Clusters and ecosystems	All phases	Page 14
2.	PUBLIC PRIVATE PARTNERSHIP IN THE NETHERLANDS: TIFN FRIESLAND CAMPINA	Clusters and ecosystems	Research & development	Page 15
3.	TRIPLE HELIX COLLABORATIONS IN FRANCE: TECHNOLOGICAL RESEARCH INSTITUTE BIOASTER	Collaborative R&D projects	Research & development	Page 17
4.	IMAGINATION FOR PEOPLE	Internet platforms and virtual networks	Idea generation	Page 20
5.	LEGO MIND STORM	Internet platforms and virtual networks	Idea generation	Page 21
		TECHNOLOGY		
6.	INWIDO WINDOW	Technology intelligence and sourcing	Idea generation & development	Page 22
7.	ROSSIGNOL AND TIME SPORT: TECHNOLOGY TRANSFER IN THE SPORTS INDUSTRY	Technology intelligence and sourcing	Development	Page 23
8.	BMW/PSA PEUGEOT CITROEN	Shared infrastructure and R&D facilities	Development & commercialisation	Page 25
9.	OI IN THE PHARMACEUTICAL SECTOR	Shared infrastructure and R&D facilities	Research	Page 26
10.	THE SAMPLE LAB! IN TOKYO	Open testing	Development & commercialisation	Page 27
11.	USER-DRIVEN INNOVATION AT DEUTSCHE TELEKOM	Open testing	Idea generation & development	Page 28
		HUMAN CAPITAL		
12.	COOPERATION BETWEEN PARISTECH AND VINCI CHAIR ECO-DESIGN OF BUILDINGS AND INFRASTRUCTURES	HR cooperation between companies and labs/ universities	Research	Page 31
13.	RESATO HIGH PRESSURE TECHNOLOGY	Effective HR mobility policy	Research & development	Page 32
14.	LATEXFALT (THE NETHERLANDS)	Collaborative leadership	Commercialisation	Page 34
		BUSINESS MODEL		
15.	BOSCH'S OPEN INNOVATION PORTALS	IP & appropriability management	Idea generation & commercialisation	Page 37
16.	IPSCORE FROM EPO	IP & appropriability management	Commercialisation	Page 38
17.	PER INNOVARE	Venture funding	Commercialisation	Page 41
18.	SPACEHIVE NEW FUNDING SOURCES FOR COMMUNITY PROJECTS	Venture funding	Idea generation & implementation	Page 42
20.	WEBMOBILI.IT	Open business models	Commercialisation	Page 44

Checklist on how you practice 'Open Innovation'

Clusters, ecosystems and networks

- Do you interact with the research community (universities, research centres, technology transfer agencies, etc) offering sources of knowledge?
- Are you actively engaged as a member of a cluster?
- Have you already successfully launched and/or implemented collaborative R&D projects within a consortium of partners?
- Do you use Internet platforms and virtual networks for posting challenges to get ideas for product/ service development?
- Do you have internal structures and processes for managing partnerships and networks?

Not really Just fine

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Technology

- Do you have a specific approach to supplier management, which is open to strategic alliances?
- Do you invest in/use shared R&D facilities together with partner companies, suppliers, or companies in other industries?
- Do you work with users and early adopters to develop prototypes of new products and services?
- Do you use technologies and expertise from other sectors for the development of you own products?
- Do you use technology-scanning/intelligence gathering to find out about new technological/market developments and what they mean for your firm's strategy?

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HR Policy

- Do you collaborate with the tertiary education on sponsorship of research chairs, student scholarships, awards and educational programmes, internships, etc?
- Do you have mechanisms to bring in fresh perspectives (breakfast meetings/informal exchanges with academics and scientists, etc, or crowdsourcing platforms for human capital)?
- Do you recruit from outside the sector or industry? Or have you developed other inter-sector mobility opportunities through staff exchanges, part-time positions, sabbaticals?
- Does your company facilitate an atmosphere where people can share ideas through cross-fertilization? Does it offer training programmes for employees to support them in networking, intercultural and creativity skills?
- Does the management team create "stretch goals" that provide the direction, but not the route, for innovation?

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Business Models

- Do you have effective IP management mechanisms enabling you to keep the right balance between transactional versus more relationship-based approaches whilst acquiring new ideas?
- Do you have active contacts or alliances with a venture capitalist helping you to raise funds for a spin-off, or to detect investment opportunities in other innovative companies?
- Do you have internal mechanisms for managing ideas that don't fit your current business (e.g. through licensing them out or spinning them off) or for acquiring and spinning-in external ventures?
- Do you deploy "probe and learn" approaches to explore new directions in technologies and markets?
- Is your current business model based on strong network relationships or on an exploratory and proactive approach to reach beyond the company's current horizon to explore new emergent issues?

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